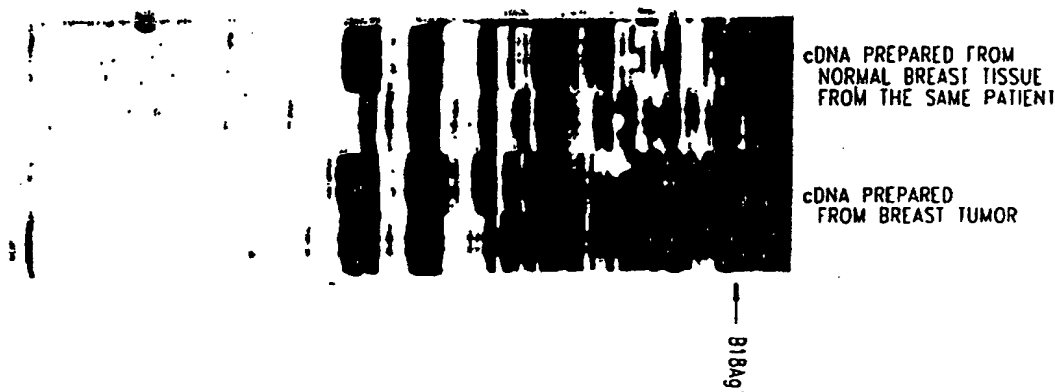




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(54) Title: COMPOSITIONS AND METHODS FOR THE TREATMENT AND DIAGNOSIS OF BREAST CANCER**(57) Abstract**

Compositions and methods for the detection and therapy of breast cancer are disclosed. The compounds provided include nucleotide sequences that are preferentially expressed in breast tumor tissue, as well as polypeptides encoded by such nucleotide sequences. Vaccines and pharmaceutical compositions comprising such compounds are also provided and may be used, for example, for the prevention and treatment of breast cancer. The polypeptides may also be used for the production of antibodies, which are useful for diagnosing and monitoring the progression of breast cancer in a patient.

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COMPOSITIONS AND METHODS FOR THE TREATMENT AND DIAGNOSIS OF BREAST CANCER

TECHNICAL FIELD

The present invention relates generally to the detection and therapy of breast cancer. The invention is more specifically related to nucleotide sequences that are preferentially expressed in breast tumor tissue and to polypeptides encoded by such nucleotide sequences. The nucleotide sequences and polypeptides may be used in vaccines and pharmaceutical compositions for the prevention and treatment of breast cancer. The polypeptides may also be used for the production of compounds, such as antibodies, useful for diagnosing and monitoring the progression of breast cancer in a patient.

BACKGROUND OF THE INVENTION

Breast cancer is a significant health problem for women in the United States and throughout the world. Although advances have been made in detection and treatment of the disease, breast cancer remains the second leading cause of cancer-related deaths in women, affecting more than 180,000 women in the United States each year. For women in North America, the life-time odds of getting breast cancer are now one in eight.

No vaccine or other universally successful method for the prevention or treatment of breast cancer is currently available. Management of the disease currently relies on a combination of early diagnosis (through routine breast screening procedures) and aggressive treatment, which may include one or more of a variety of treatments such as surgery, radiotherapy, chemotherapy and hormone therapy. The course of treatment for a particular breast cancer is often selected based on a variety of prognostic parameters, including an analysis of specific tumor markers. See, e.g., Porter-Jordan and Lippman, *Breast Cancer* 8:73-100 (1994). However, the use of established markers often leads to a result that is difficult to interpret, and the high mortality observed in

breast cancer patients indicates that improvements are needed in the treatment, diagnosis and prevention of the disease.

Accordingly, there is a need in the art for improved methods for therapy and diagnosis of breast cancer. The present invention fulfills these needs and further
5 provides other related advantages.

SUMMARY OF THE INVENTION

Briefly stated, the subject invention provides compositions and methods for the diagnosis and therapy of breast cancer. In one aspect, isolated polynucleotides are provided, comprising (a) a nucleotide sequence preferentially expressed in breast cancer
10 tissue, relative to normal tissue; (b) a variant of such a sequence, as defined below; or (c) a nucleotide sequence encoding an epitope of a polypeptide encoded by at least one of the above sequences. In one embodiment, the isolated polynucleotide comprises a human endogenous retroviral sequence recited in SEQ ID NO:1. In other embodiments, the isolated polynucleotide comprises a sequence recited in any one of SEQ ID NO: 3-
15 26, 28-77, 142, 143, 146-152, 154-166, 168-176, 178-192, 194-198, 200-204, 206, 207, 209-214, 216, 218, 219, 221-240, 243-245, 247, 250, 251, 253, 255, 257-266, 268, 269, 271-273, 275, 276, 278, 280, 281, 284, 288, 291-298, 301-303, 307, 313, 314, 316 and 317.

In related embodiments, the isolated polynucleotide encodes an epitope of
20 a polypeptide, wherein the polypeptide is encoded by a nucleotide sequence that: (a) hybridizes to a sequence recited in any one of SEQ ID NO: 1, 3-26, 28-77, 142, 143, 146-152, 154-166, 168-176, 178-192, 194-198, 200-204, 206, 207, 209-214, 216, 218, 219, 221-240, 243-245, 247, 250, 251, 253, 255, 257-266, 268, 269, 271-273, 275, 276, 278, 280, 281, 284, 288, 291-298, 301-303, 307, 313, 314, 316 and 317 under stringent
25 conditions; and (b) is at least 80% identical to a sequence recited in any one of SEQ ID NO: 1, 3-26, 28-77, 142, 143, 146-152, 154-166, 168-176, 178-192, 194-198, 200-204, 206, 207, 209-214, 216, 218, 219, 221-240, 243-245, 247, 250, 251, 253, 255, 257-266, 268, 269, 271-273, 275, 276, 278, 280, 281, 284, 288, 291-298, 301-303, 307, 313, 314, 316 and 317.

In another embodiment, the present invention provides an isolated polynucleotide encoding an epitope of a polypeptide, the polypeptide being encoded by: (a) a nucleotide sequence transcribed from the sequence of SEQ ID NO: 141; or (b) a variant of said nucleotide sequence that contains one or more nucleotide substitutions, deletions, insertions and/or modifications at no more than 20% of the nucleotide positions, such that the antigenic and/or immunogenic properties of the polypeptide encoded by the nucleotide sequence are retained. Isolated DNA and RNA molecules comprising a nucleotide sequence complementary to a polynucleotide as described above are also provided.

10 In related aspects, the present invention provides recombinant expression vectors comprising a polynucleotide as described above and host cells transformed or transfected with such expression vectors.

In further aspects, polypeptides comprising an amino acid sequence encoded by a polynucleotide as described above, and monoclonal antibodies that bind to such polypeptides are provided. In certain embodiments, the inventive polypeptides comprise an amino acid sequence selected from the group consisting of SEQ ID NO: 299, 300, 304-306, 308 and 315, and variants thereof as defined below.

In yet another aspect, methods are provided for determining the presence of breast cancer in a patient. In one embodiment, the method comprises detecting, within a biological sample, a polypeptide as described above. In another embodiment, the method comprises detecting, within a biological sample, an RNA molecule encoding a polypeptide as described above. In yet another embodiment, the method comprises (a) intradermally injecting a patient with a polypeptide as described above; and (b) detecting an immune response on the patient's skin and therefrom detecting the presence of breast cancer in the patient. In further embodiments, the present invention provides methods for determining the presence of breast cancer in a patient as described above wherein the polypeptide is encoded by a nucleotide sequence selected from the group consisting of SEQ ID NO: 78-86, 144, 145, 153, 167, 177, 193, 199, 205, 208, 215, 217, 220, 241, 242, 246, 248, 249, 252, 256, 267, 270, 274, 277, 279, 282, 283, 285-287, 289, 290 and sequences that hybridize thereto under stringent conditions.

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In a related aspect, diagnostic kits useful in the determination of breast cancer are provided. The diagnostic kits generally comprise either one or more monoclonal antibodies as described above, or one or more monoclonal antibodies that bind to a polypeptide encoded by a nucleotide sequence selected from the group consisting of sequences provided in SEQ ID NO: 78-86, 144, 145, 153, 167, 177, 193, 199, 205, 208, 215, 217, 220, 241, 242 and 246, 248, 249, 252, 256, 267, 270, 274, 277, 279, 282, 283, 285-287, 289, 290 and a detection reagent.

Diagnostic kits are also provided that comprise a first polymerase chain reaction primer and a second polymerase chain reaction primer, at least one of the primers being specific for a polynucleotide described herein. In one embodiment, at least one of the primers comprises at least about 10 contiguous nucleotides of a polynucleotide as described above, or a polynucleotide encoding a polypeptide encoded by a sequence selected from the group consisting of SEQ ID NO: 78-86, 144, 145, 153, 167, 177, 193, 199, 205, 208, 215, 217, 220, 241, 242 246, 248, 249, 252, 256, 267, 270, 274, 277, 279, 282, 283, 285-287, 289 and 290.

Within another related aspect, the diagnostic kit comprises at least one oligonucleotide probe, the probe being specific for a polynucleotide described herein. In one embodiment, the probe comprises at least about 15 contiguous nucleotides of a polynucleotide as described above, or a polynucleotide selected from the group consisting of SEQ ID NO: 78-86, 144, 145, 153, 167, 177, 193, 199, 205, 208, 215, 217, 220, 241, 242 246, 248, 249, 252, 256, 267, 270, 274, 277, 279, 282, 283, 285-287, 289 and 290.

In another related aspect, the present invention provides methods for monitoring the progression of breast cancer in a patient. In one embodiment, the method comprises: (a) detecting an amount, in a biological sample, of a polypeptide as described above at a first point in time; (b) repeating step (a) at a subsequent point in time; and (c) comparing the amounts of polypeptide detected in steps (a) and (b), and therefrom monitoring the progression of breast cancer in the patient. In another embodiment, the method comprises (a) detecting an amount, within a biological sample, of an RNA molecule encoding a polypeptide as described above at a first point in time; (b) repeating

step (a) at a subsequent point in time; and (c) comparing the amounts of RNA molecules detected in steps (a) and (b), and therefrom monitoring the progression of breast cancer in the patient. In yet other embodiments, the present invention provides methods for monitoring the progression of breast cancer in a patient as described above wherein the polypeptide is encoded by a nucleotide sequence selected from the group consisting of SEQ ID NO: 78-86, 144, 145, 153, 167, 177, 193, 199, 205, 208, 215, 217, 220, 241, 242, 246, 248, 249, 252, 256, 267, 270, 274, 277, 279, 282, 283, 285-287, 289, 290 and sequences that hybridize thereto under stringent conditions.

In still other aspects, pharmaceutical compositions, which comprise a polypeptide as described above in combination with a physiologically acceptable carrier, and vaccines, which comprise a polypeptide as described above in combination with an immunostimulant or adjuvant, are provided. In yet other aspects, the present invention provides pharmaceutical compositions and vaccines comprising a polypeptide encoded by a nucleotide sequence selected from the group consisting of SEQ ID NO: 78-86, 144, 145, 153, 167, 177, 193, 199, 205, 208, 215, 217, 220, 241, 242 and 246, 248, 249, 252, 256, 267, 270, 274, 277, 279, 282, 283, 285-287, 289, 290 and sequences that hybridize thereto under stringent conditions.

In related aspects, the present invention provides methods for inhibiting the development of breast cancer in a patient, comprising administering to a patient a pharmaceutical composition or vaccine as described above.

These and other aspects of the present invention will become apparent upon reference to the following detailed description and attached drawings. All references disclosed herein are hereby incorporated by reference in their entirety as if each was incorporated individually.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 shows the differential display PCR products, separated by gel electrophoresis, obtained from cDNA prepared from normal breast tissue (lanes 1 and 2) and from cDNA prepared from breast tumor tissue from the same patient (lanes 3 and 4). The arrow indicates the band corresponding to B18Ag1.

Figure 2 is a northern blot comparing the level of B18Ag1 mRNA in breast tumor tissue (lane 1) with the level in normal breast tissue.

Figure 3 shows the level of B18Ag1 mRNA in breast tumor tissue compared to that in various normal and non-breast tumor tissues as determined by RNase
5 protection assays.

Figure 4 is a genomic clone map showing the location of additional retroviral sequences obtained from ends of XbaI restriction digests (provided in SEQ ID NO:3 - SEQ ID NO:10) relative to B18Ag1.

Figures 5A and 5B show the sequencing strategy, genomic organization
10 and predicted open reading frame for the retroviral element containing B18Ag1.

Figure 6 shows the nucleotide sequence of the representative breast tumor-specific cDNA B18Ag1.

Figure 7 shows the nucleotide sequence of the representative breast tumor-specific cDNA B17Ag1.

15 Figure 8 shows the nucleotide sequence of the representative breast tumor-specific cDNA B17Ag2.

Figure 9 shows the nucleotide sequence of the representative breast tumor-specific cDNA B13Ag2a.

Figure 10 shows the nucleotide sequence of the representative breast
20 tumor-specific cDNA B13Ag1b.

Figure 11 shows the nucleotide sequence of the representative breast tumor-specific cDNA B13Ag1a.

Figure 12 shows the nucleotide sequence of the representative breast tumor-specific cDNA B11Ag1.

25 Figure 13 shows the nucleotide sequence of the representative breast tumor-specific cDNA B3CA3c.

Figure 14 shows the nucleotide sequence of the representative breast tumor-specific cDNA B9CG1.

Figure 15 shows the nucleotide sequence of the representative breast
30 tumor-specific cDNA B9CG3.

Figure 16 shows the nucleotide sequence of the representative breast tumor-specific cDNA B2CA2.

Figure 17 shows the nucleotide sequence of the representative breast tumor-specific cDNA B3CA1.

5 Figure 18 shows the nucleotide sequence of the representative breast tumor-specific cDNA B3CA2.

Figure 19 shows the nucleotide sequence of the representative breast tumor-specific cDNA B3CA3.

10 Figure 20 shows the nucleotide sequence of the representative breast tumor-specific cDNA B4CA1.

Figure 21A depicts RT-PCR analysis of breast tumor genes in breast tumor tissues (lanes 1-8) and normal breast tissues (lanes 9-13) and H₂O (lane 14).

Figure 21B depicts RT-PCR analysis of breast tumor genes in prostate tumors (lane 1, 2), colon tumors (lane 3), lung tumor (lane 4), normal prostate (lane 5),
15 normal colon (lane 6), normal kidney (lane 7), normal liver (lane 8), normal lung (lane 9), normal ovary (lanes 10, 18), normal pancreases (lanes 11, 12), normal skeletal muscle (lane 13), normal skin (lane 14), normal stomach (lane 15), normal testes (lane 16), normal small intestine (lane 17), HBL-100 (lane 19), MCF-12A (lane 20), breast tumors (lanes 21-23), H₂O (lane 24), and colon tumor (lane 25).

20 Figure 22 shows the recognition of a B11Ag1 peptide (referred to as B11-8) by an anti-B11-8 CTL line.

Figure 23 shows the recognition of a cell line transduced with the antigen B11Ag1 by the B11-8 specific clone A1.

25 Figure 24 shows recognition of a lung adenocarcinoma line (LT-140-22) and a breast adenocarcinoma line (CAMA-1) by the B11-8 specific clone A1.

DETAILED DESCRIPTION OF THE INVENTION

As noted above, the present invention is generally directed to compositions and methods for the diagnosis, monitoring and therapy of breast cancer. The compositions described herein include polypeptides, polynucleotides and antibodies.

Polypeptides of the present invention generally comprise at least a portion of a protein that is expressed at a greater level in human breast tumor tissue than in normal breast tissue (*i.e.*, the level of RNA encoding the polypeptide is at least 2-fold higher in tumor tissue). Such polypeptides are referred to herein as breast tumor-specific polypeptides, and cDNA molecules encoding such polypeptides are referred to as breast tumor-specific cDNAs. Polynucleotides of the subject invention generally comprise a DNA or RNA sequence that encodes all or a portion of a polypeptide as described above, or that is complementary to such a sequence. Antibodies are generally immune system proteins, or fragments thereof, that are capable of binding to a portion of a polypeptide as described above. Antibodies can be produced by cell culture techniques, including the generation of monoclonal antibodies as described herein, or via transfection of antibody genes into suitable bacterial or mammalian cell hosts, in order to allow for the production of recombinant antibodies.

Polypeptides within the scope of this invention include, but are not limited to, polypeptides (and epitopes thereof) encoded by a human endogenous retroviral sequence, such as the sequence designated B18Ag1 (Figure 5 and SEQ ID NO:1). Also within the scope of the present invention are polypeptides encoded by other sequences within the retroviral genome containing B18Ag1 (SEQ ID NO: 141). Such sequences include, but are not limited to, the sequences recited in SEQ ID NO:3 - SEQ ID NO:10. B18Ag1 has homology to the *gag* p30 gene of the endogenous human retroviral element S71, as described in Werner et al., *Virology* 174:225-238 (1990) and also shows homology to about thirty other retroviral *gag* genes. As discussed in more detail below, the present invention also includes a number of additional breast tumor-specific polypeptides, such as those encoded by the nucleotide sequences recited in SEQ ID NO: 11-26, 28-77, 142, 143, 146-152, 154-166, 168-176, 178-192, 194-198, 200-204, 206, 207, 209-214, 216, 218, 219, 221-240, 243-245, 247, 250, 251, 253, 255, 257-266, 268, 269, 271-273, 275, 276, 278, 280, 281, 284, 288, 291-298, 301-303, 307, 313, 314, 316 and 317.

As used herein, the term "polypeptide" encompasses amino acid chains of any length, including full length proteins containing the sequences recited herein. A

polypeptide comprising an epitope of a protein containing a sequence as described herein may consist entirely of the epitope, or may contain additional sequences. The additional sequences may be derived from the native protein or may be heterologous, and such sequences may (but need not) possess immunogenic or antigenic properties.

5 An "epitope," as used herein is a portion of a polypeptide that is recognized (*i.e.*, specifically bound) by a B-cell and/or T-cell surface antigen receptor. Epitopes may generally be identified using well known techniques, such as those summarized in Paul, *Fundamental Immunology*, 3rd ed., 243-247 (Raven Press, 1993) and references cited therein. Such techniques include screening polypeptides derived
10 from the native polypeptide for the ability to react with antigen-specific antisera and/or T-cell lines or clones. An epitope of a polypeptide is a portion that reacts with such antisera and/or T-cells at a level that is similar to the reactivity of the full length polypeptide (*e.g.*, in an ELISA and/or T-cell reactivity assay). Such screens may generally be performed using methods well known to those of ordinary skill in the art,
15 such as those described in Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988. B-cell and T-cell epitopes may also be predicted via computer analysis. Polypeptides comprising an epitope of a polypeptide that is preferentially expressed in a tumor tissue (with or without additional amino acid sequence) are within the scope of the present invention.

20 The term "polynucleotide(s)," as used herein, means a single or double-stranded polymer of deoxyribonucleotide or ribonucleotide bases and includes DNA and corresponding RNA molecules, including HnRNA and mRNA molecules, both sense and anti-sense strands, and comprehends cDNA, genomic DNA and recombinant DNA, as well as wholly or partially synthesized polynucleotides. An HnRNA molecule contains
25 introns and corresponds to a DNA molecule in a generally one-to-one manner. An mRNA molecule corresponds to an HnRNA and DNA molecule from which the introns have been excised. A polynucleotide may consist of an entire gene, or any portion thereof. Operable anti-sense polynucleotides may comprise a fragment of the corresponding polynucleotide, and the definition of "polynucleotide" therefore includes
30 all such operable anti-sense fragments.

The compositions and methods of the present invention also encompass variants of the above polypeptides and polynucleotides.

A polypeptide "variant," as used herein, is a polypeptide that differs from the recited polypeptide only in conservative substitutions and/or modifications, such that the antigenic properties of the polypeptide are retained. In a preferred embodiment, variant polypeptides differ from an identified sequence by substitution, deletion or addition of five amino acids or fewer. Such variants may generally be identified by modifying one of the above polypeptide sequences, and evaluating the antigenic properties of the modified polypeptide using, for example, the representative procedures described herein. Polypeptide variants preferably exhibit at least about 70%, more preferably at least about 90% and most preferably at least about 95% identity (determined as described below) to the identified polypeptides.

As used herein, a "conservative substitution" is one in which an amino acid is substituted for another amino acid that has similar properties, such that one skilled in the art of peptide chemistry would expect the secondary structure and hydrophobic nature of the polypeptide to be substantially unchanged. In general, the following groups of amino acids represent conservative changes: (1) ala, pro, gly, glu, asp, gln, asn, ser, thr; (2) cys, ser, tyr, thr; (3) val, ile, leu, met, ala, phe; (4) lys, arg, his; and (5) phe, tyr, trp, his.

Variants may also, or alternatively, contain other modifications, including the deletion or addition of amino acids that have minimal influence on the antigenic properties, secondary structure and hydrophobic nature of the polypeptide. For example, a polypeptide may be conjugated to a signal (or leader) sequence at the N-terminal end of the protein which co-translationally or post-translationally directs transfer of the protein. The polypeptide may also be conjugated to a linker or other sequence for ease of synthesis, purification or identification of the polypeptide (e.g., poly-His), or to enhance binding of the polypeptide to a solid support. For example, a polypeptide may be conjugated to an immunoglobulin Fc region.

A nucleotide "variant" is a sequence that differs from the recited nucleotide sequence in having one or more nucleotide deletions, substitutions or

additions. Such modifications may be readily introduced using standard mutagenesis techniques, such as oligonucleotide-directed site-specific mutagenesis as taught, for example, by Adelman et al. (*DNA*, 2:183, 1983). Nucleotide variants may be naturally occurring allelic variants, or non-naturally occurring variants. Variant nucleotide sequences preferably exhibit at least about 70%, more preferably at least about 80% and most preferably at least about 90% identity (determined as described below) to the recited sequence.

The breast tumor antigens provided by the present invention include variants that are encoded by DNA sequences which are substantially homologous to one or more of the DNA sequences specifically recited herein. "Substantial homology," as used herein, refers to DNA sequences that are capable of hybridizing under moderately stringent conditions. Suitable moderately stringent conditions include prewashing in a solution of 5X SSC, 0.5% SDS, 1.0 mM EDTA (pH 8.0); hybridizing at 50°C-65°C, 5X SSC, overnight or, in the event of cross-species homology, at 45°C with 0.5X SSC; followed by washing twice at 65°C for 20 minutes with each of 2X, 0.5X and 0.2X SSC containing 0.1% SDS. Such hybridizing DNA sequences are also within the scope of this invention, as are nucleotide sequences that, due to code degeneracy, encode an immunogenic polypeptide that is encoded by a hybridizing DNA sequence.

Two nucleotide or polypeptide sequences are said to be "identical" if the sequence of nucleotides or amino acid residues in the two sequences is the same when aligned for maximum correspondence as described below. Comparisons between two sequences are typically performed by comparing the sequences over a comparison window to identify and compare local regions of sequence similarity. A "comparison window" as used herein, refers to a segment of at least about 20 contiguous positions, usually 30 to about 75, 40 to about 50, in which a sequence may be compared to a reference sequence of the same number of contiguous positions after the two sequences are optimally aligned.

Optimal alignment of sequences for comparison may be conducted using the Megalign program in the Lasergene suite of bioinformatics software (DNASTAR, Inc., Madison, WI), using default parameters. This program embodies several alignment

- schemes described in the following references: Dayhoff, M.O. (1978) A model of evolutionary change in proteins – Matrices for detecting distant relationships. In Dayhoff, M.O. (ed.) Atlas of Protein Sequence and Structure, National Biomedical Research Foundation, Washington DC Vol. 5, Suppl. 3, pp. 345-358; Hein J. (1990)
- 5 Unified Approach to Alignment and Phylogenesis pp. 626-645 *Methods in Enzymology* vol. 183, Academic Press, Inc., San Diego, CA; Higgins, D.G. and Sharp, P.M. (1989) Fast and sensitive multiple sequence alignments on a microcomputer *CABIOS* 5:151-153; Myers, E.W. and Muller W. (1988) Optimal alignments in linear space *CABIOS* 4:11-17; Robinson, E.D. (1971) *Comb. Theor* 11:105; Santou, N. Nes, M. (1987) The
- 10 neighbor joining method. A new method for reconstructing phylogenetic trees *Mol. Biol. Evol.* 4:406-425; Sneath, P.H.A. and Sokal, R.R. (1973) *Numerical Taxonomy – the Principles and Practice of Numerical Taxonomy*, Freeman Press, San Francisco, CA; Wilbur, W.J. and Lipman, D.J. (1983) Rapid similarity searches of nucleic acid and protein data banks *Proc. Natl. Acad., Sci. USA* 80:726-730.
- 15 Preferably, the “percentage of sequence identity” is determined by comparing two optimally aligned sequences over a window of comparison of at least 20 positions, wherein the portion of the polynucleotide sequence in the comparison window may comprise additions or deletions (i.e. gaps) of 20 percent or less, usually 5 to 15 percent, or 10 to 12 percent, as compared to the reference sequences
- 20 (which does not comprise additions or deletions) for optimal alignment of the two sequences. The percentage is calculated by determining the number of positions at which the identical nucleic acid bases or amino acid residue occurs in both sequences to yield the number of matched positions, dividing the number of matched positions by the total number of positions in the reference sequence (i.e. the window size) and multiplying the
- 25 results by 100 to yield the percentage of sequence identity. In general, polynucleotides encoding all or a portion of the polypeptides described herein may be prepared using any of several techniques. For example, cDNA molecules encoding such polypeptides may be cloned on the basis of the breast tumor-specific expression of the corresponding mRNAs, using differential display PCR. This technique compares the amplified
- 30 products from RNA template prepared from normal and breast tumor tissue. cDNA may

be prepared by reverse transcription of RNA using a (dT)₁₂AG primer. Following amplification of the cDNA using a random primer, a band corresponding to an amplified product specific to the tumor RNA may be cut out from a silver stained gel and subcloned into a suitable vector (e.g., the T-vector, Novagen, Madison, WI).

5 Polynucleotides encoding all or a portion of the breast tumor-specific polypeptides disclosed herein may be amplified from cDNA prepared as described above using the random primers shown in SEQ ID NO.:87-125.

Alternatively, a polynucleotide encoding a polypeptide as described herein (or a portion thereof) may be amplified from human genomic DNA, or from breast

10 tumor cDNA, via polymerase chain reaction. For this approach, B18Ag1 sequence-specific primers may be designed based on the sequence provided in SEQ ID NO:1, and may be purchased or synthesized. One suitable primer pair for amplification from breast tumor cDNA is (5'ATG GCT ATT TTC GGG GGC TGA CA) (SEQ ID NO:126) and (5'CCG GTA TCT CCT CGT GGG TAT T) (SEQ ID NO:127). An amplified portion of

15 B18Ag1 may then be used to isolate the full length gene from a human genomic DNA library or from a breast tumor cDNA library, using well known techniques, such as those described in Sambrook et al., *Molecular Cloning: A Laboratory Manual*, Cold Spring Harbor Laboratories, Cold Spring Harbor, NY (1989). Other sequences within the retroviral genome of which B18Ag1 is a part may be similarly prepared by screening

20 human genomic libraries using B18Ag1-specific sequences as probes. Nucleotides translated into protein from the retroviral genome shown in SEQ ID NO: 141 may then be determined by cloning the corresponding cDNAs, predicting the open reading frames and cloning the appropriate cDNAs into a vector containing a viral promoter, such as T7. The resulting constructs can be employed in a translation reaction, using techniques

25 known to those of skill in the art, to identify nucleotide sequences which result in expressed protein. Similarly, primers specific for the remaining breast tumor-specific polypeptides described herein may be designed based on the nucleotide sequences provided in SEQ ID NO:11-86, 142-298, 301-303, 307, 313, 314, 316 and 317.

Recombinant polypeptides encoded by the DNA sequences described

30 above may be readily prepared from the DNA sequences. For example, supernatants

from suitable host/vector systems which secrete recombinant protein or polypeptide into culture media may be first concentrated using a commercially available filter. Following concentration, the concentrate may be applied to a suitable purification matrix such as an affinity matrix or an ion exchange resin. Finally, one or more reverse phase HPLC steps
5 can be employed to further purify a recombinant polypeptide.

In general, any of a variety of expression vectors known to those of ordinary skill in the art may be employed to express recombinant polypeptides of this invention. Expression may be achieved in any appropriate host cell that has been transformed or transfected with an expression vector containing a polynucleotide that
10 encodes a recombinant polypeptide. Suitable host cells include prokaryotes, yeast and higher eukaryotic cells. Preferably, the host cells employed are *E. coli*, yeast or a mammalian cell line such as COS or CHO.

Such techniques may also be used to prepare polypeptides comprising epitopes or variants of the native polypeptides. For example, variants of a native
15 polypeptide may generally be prepared using standard mutagenesis techniques, such as oligonucleotide-directed site-specific mutagenesis, and sections of the DNA sequence may be removed to permit preparation of truncated polypeptides. Portions and other variants having fewer than about 100 amino acids, and generally fewer than about 50 amino acids, may also be generated by synthetic means, using techniques well known to
20 those of ordinary skill in the art. For example, such polypeptides may be synthesized using any of the commercially available solid-phase techniques, such as the Merrifield solid-phase synthesis method, where amino acids are sequentially added to a growing amino acid chain. See Merrifield, *J. Am. Chem. Soc.* 85:2149-2146 (1963). Equipment for automated synthesis of polypeptides is commercially available from suppliers such as
25 Perkin Elmer/Applied BioSystems Division,, Foster City, CA, and may be operated according to the manufacturer's instructions.

In specific embodiments, polypeptides of the present invention encompass amino acid sequences encoded by a polynucleotide having a sequence recited in any one of SEQ ID NO:1, 3-26, 28-77, 142, 143, 146-152, 154-166, 168-176, 178-192, 194-198,
30 200-204, 206, 207, 209-214, 216, 218, 219, 221-240, 243-245, 247, 250, 251, 253, 255,

257-266, 268, 269, 271-273, 275, 276, 278, 280, 281, 284, 288, 291-298, 301-303, 307, 313, 314, 316 and 317, and variants of such polypeptides. Polypeptides within the scope of the present invention also include polypeptides (and epitopes thereof) encoded by DNA sequences that hybridize to a sequence recited in any one of SEQ ID NO:1, 3-26, 28-77, 142, 143, 146-152, 154-166, 168-176, 178-192, 194-198, 200-204, 206, 207, 209-214, 216, 218, 219, 221-240, 243-245, 247, 250, 251, 253, 255, 257-266, 268, 269, 271-273, 275, 276, 278, 280, 281, 284, 288, 291-298, 301-303, 307, 313, 314, 316 and 317 under stringent conditions, wherein the DNA sequences are at least 80% identical in overall sequence to a recited sequence and wherein RNA corresponding to the nucleotide sequence is expressed at a greater level in human breast tumor tissue than in normal breast tissue. As used herein, "stringent conditions" refers to prewashing in a solution of 6X SSC, 0.2% SDS; hybridizing at 65°C, 6X SSC, 0.2% SDS overnight; followed by two washes of 30 minutes each in 1X SSC, 0.1% SDS at 65°C and two washes of 30 minutes each in 0.2 X SSC, 0.1% SDS at 65°C. Polynucleotides according to the present invention include molecules that encode any of the above polypeptides.

In another aspect of the present invention, antibodies are provided. Such antibodies may be prepared by any of a variety of techniques known to those of ordinary skill in the art. See, e.g., Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988. In one such technique, an immunogen comprising the polypeptide is initially injected into any of a wide variety of mammals (e.g., mice, rats, rabbits, sheep or goats). In this step, the polypeptides of this invention may serve as the immunogen without modification. Alternatively, particularly for relatively short polypeptides, a superior immune response may be elicited if the polypeptide is joined to a carrier protein, such as bovine serum albumin or keyhole limpet hemocyanin. The immunogen is injected into the animal host, preferably according to a predetermined schedule incorporating one or more booster immunizations, and the animals are bled periodically. Polyclonal antibodies specific for the polypeptide may then be purified from such antisera by, for example, affinity chromatography using the polypeptide coupled to a suitable solid support.

Monoclonal antibodies specific for the antigenic polypeptide of interest may be prepared, for example, using the technique of Kohler and Milstein, *Eur. J. Immunol.* 6:511-519 (1976), and improvements thereto. Briefly, these methods involve the preparation of immortal cell lines capable of producing antibodies having the desired specificity (*i.e.*, reactivity with the polypeptide of interest). Such cell lines may be produced, for example, from spleen cells obtained from an animal immunized as described above. The spleen cells are then immortalized by, for example, fusion with a myeloma cell fusion partner, preferably one that is syngeneic with the immunized animal. A variety of fusion techniques may be employed. For example, the spleen cells and myeloma cells may be combined with a nonionic detergent for a few minutes and then plated at low density on a selective medium that supports the growth of hybrid cells, but not myeloma cells. A preferred selection technique uses HAT (hypoxanthine, aminopterin, thymidine) selection. After a sufficient time, usually about 1 to 2 weeks, colonies of hybrids are observed. Single colonies are selected and their culture supernatants tested for binding activity against the polypeptide. Hybridomas having high reactivity and specificity are preferred.

Monoclonal antibodies may be isolated from the supernatants of growing hybridoma colonies. In addition, various techniques may be employed to enhance the yield, such as injection of the hybridoma cell line into the peritoneal cavity of a suitable vertebrate host, such as a mouse. Monoclonal antibodies may then be harvested from the ascites fluid or the blood. Contaminants may be removed from the antibodies by conventional techniques, such as chromatography, gel filtration, precipitation, and extraction. The polypeptides of this invention may be used in the purification process in, for example, an affinity chromatography step.

Antibodies may be used, for example, in methods for detecting breast cancer in a patient. Such methods involve using an antibody to detect the presence or absence of a breast tumor-specific polypeptide as described herein in a suitable biological sample. As used herein, suitable biological samples include tumor or normal tissue biopsy, mastectomy, blood, lymph node, serum or urine samples, or other tissue, homogenate, or extract thereof obtained from a patient.

There are a variety of assay formats known to those of ordinary skill in the art for using an antibody to detect polypeptide markers in a sample. *See, e.g.,* Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988. For example, the assay may be performed in a Western blot format, wherein a protein
5 preparation from the biological sample is submitted to gel electrophoresis, transferred to a suitable membrane and allowed to react with the antibody. The presence of the antibody on the membrane may then be detected using a suitable detection reagent, as described below.

In another embodiment, the assay involves the use of antibody
10 immobilized on a solid support to bind to the polypeptide and remove it from the remainder of the sample. The bound polypeptide may then be detected using a second antibody or reagent that contains a reporter group. Alternatively, a competitive assay may be utilized, in which a polypeptide is labeled with a reporter group and allowed to bind to the immobilized antibody after incubation of the antibody with the sample. The
15 extent to which components of the sample inhibit the binding of the labeled polypeptide to the antibody is indicative of the reactivity of the sample with the immobilized antibody, and as a result, indicative of the concentration of polypeptide in the sample.

The solid support may be any material known to those of ordinary skill in the art to which the antibody may be attached. For example, the solid support may be a
20 test well in a microtiter plate or a nitrocellulose filter or other suitable membrane. Alternatively, the support may be a bead or disc, such as glass, fiberglass, latex or a plastic material such as polystyrene or polyvinylchloride. The support may also be a magnetic particle or a fiber optic sensor, such as those disclosed, for example, in U.S. Patent No. 5,359,681.

25 The antibody may be immobilized on the solid support using a variety of techniques known to those in the art, which are amply described in the patent and scientific literature. In the context of the present invention, the term "immobilization" refers to both noncovalent association, such as adsorption, and covalent attachment (which may be a direct linkage between the antigen and functional groups on the support
30 or may be a linkage by way of a cross-linking agent). Immobilization by adsorption to a

well in a microtiter plate or to a membrane is preferred. In such cases, adsorption may be achieved by contacting the antibody, in a suitable buffer, with the solid support for a suitable amount of time. The contact time varies with temperature, but is typically between about 1 hour and 1 day. In general, contacting a well of a plastic microtiter plate (such as polystyrene or polyvinylchloride) with an amount of antibody ranging from about 10 ng to about 1 μ g, and preferably about 100-200 ng, is sufficient to immobilize an adequate amount of polypeptide.

Covalent attachment of antibody to a solid support may also generally be achieved by first reacting the support with a bifunctional reagent that will react with both the support and a functional group, such as a hydroxyl or amino group, on the antibody. For example, the antibody may be covalently attached to supports having an appropriate polymer coating using benzoquinone or by condensation of an aldehyde group on the support with an amine and an active hydrogen on the binding partner (*see, e.g.*, Pierce Immunotechnology Catalog and Handbook (1991) at A12-A13).

In certain embodiments, the assay for detection of polypeptide in a sample is a two-antibody sandwich assay. This assay may be performed by first contacting an antibody that has been immobilized on a solid support, commonly the well of a microtiter plate, with the biological sample, such that the polypeptide within the sample are allowed to bind to the immobilized antibody. Unbound sample is then removed from the immobilized polypeptide-antibody complexes and a second antibody (containing a reporter group) capable of binding to a different site on the polypeptide is added. The amount of second antibody that remains bound to the solid support is then determined using a method appropriate for the specific reporter group.

More specifically, once the antibody is immobilized on the support as described above, the remaining protein binding sites on the support are typically blocked. Any suitable blocking agent known to those of ordinary skill in the art, such as bovine serum albumin or Tween 20™ (Sigma Chemical Co., St. Louis, MO). The immobilized antibody is then incubated with the sample, and polypeptide is allowed to bind to the antibody. The sample may be diluted with a suitable diluent, such as phosphate-buffered saline (PBS) prior to incubation. In general, an appropriate contact time (*i.e.*, incubation

time) is that period of time that is sufficient to detect the presence of polypeptide within a sample obtained from an individual with breast cancer. Preferably, the contact time is sufficient to achieve a level of binding that is at least 95% of that achieved at equilibrium between bound and unbound polypeptide. Those of ordinary skill in the art will
5 recognize that the time necessary to achieve equilibrium may be readily determined by assaying the level of binding that occurs over a period of time. At room temperature, an incubation time of about 30 minutes is generally sufficient.

Unbound sample may then be removed by washing the solid support with an appropriate buffer, such as PBS containing 0.1% Tween 20™. The second antibody,
10 which contains a reporter group, may then be added to the solid support. Preferred reporter groups include enzymes (such as horseradish peroxidase), substrates, cofactors, inhibitors, dyes, radionuclides, luminescent groups, fluorescent groups and biotin. The conjugation of antibody to reporter group may be achieved using standard methods known to those of ordinary skill in the art.

15 The second antibody is then incubated with the immobilized antibody-polypeptide complex for an amount of time sufficient to detect the bound polypeptide. An appropriate amount of time may generally be determined by assaying the level of binding that occurs over a period of time. Unbound second antibody is then removed and bound second antibody is detected using the reporter group. The method employed
20 for detecting the reporter group depends upon the nature of the reporter group. For radioactive groups, scintillation counting or autoradiographic methods are generally appropriate. Spectroscopic methods may be used to detect dyes, luminescent groups and fluorescent groups. Biotin may be detected using avidin, coupled to a different reporter group (commonly a radioactive or fluorescent group or an enzyme). Enzyme reporter
25 groups may generally be detected by the addition of substrate (generally for a specific period of time), followed by spectroscopic or other analysis of the reaction products.

To determine the presence or absence of breast cancer, the signal detected from the reporter group that remains bound to the solid support is generally compared to a signal that corresponds to a predetermined cut-off value established from non-tumor
30 tissue. In one preferred embodiment, the cut-off value is the average mean signal

obtained when the immobilized antibody is incubated with samples from patients without breast cancer. In general, a sample generating a signal that is three standard deviations above the predetermined cut-off value may be considered positive for breast cancer. In an alternate preferred embodiment, the cut-off value is determined using a Receiver Operator Curve, according to the method of Sackett et al., *Clinical Epidemiology: A Basic Science for Clinical Medicine*, p. 106-7 (Little Brown and Co., 1985). Briefly, in this embodiment, the cut-off value may be determined from a plot of pairs of true positive rates (*i.e.*, sensitivity) and false positive rates (100%-specificity) that correspond to each possible cut-off value for the diagnostic test result. The cut-off value on the plot that is the closest to the upper left-hand corner (*i.e.*, the value that encloses the largest area) is the most accurate cut-off value, and a sample generating a signal that is higher than the cut-off value determined by this method may be considered positive. Alternatively, the cut-off value may be shifted to the left along the plot, to minimize the false positive rate, or to the right, to minimize the false negative rate. In general, a sample generating a signal that is higher than the cut-off value determined by this method is considered positive for breast cancer.

In a related embodiment, the assay is performed in a flow-through or strip test format, wherein the antibody is immobilized on a membrane, such as nitrocellulose. In the flow-through test, the polypeptide within the sample bind to the immobilized antibody as the sample passes through the membrane. A second, labeled antibody then binds to the antibody-polypeptide complex as a solution containing the second antibody flows through the membrane. The detection of bound second antibody may then be performed as described above. In the strip test format, one end of the membrane to which antibody is bound is immersed in a solution containing the sample. The sample migrates along the membrane through a region containing second antibody and to the area of immobilized antibody. Concentration of second antibody at the area of immobilized antibody indicates the presence of breast cancer. Typically, the concentration of second antibody at that site generates a pattern, such as a line, that can be read visually. The absence of such a pattern indicates a negative result. In general, the amount of antibody immobilized on the membrane is selected to generate a visually

discernible pattern when the biological sample contains a level of polypeptide that would be sufficient to generate a positive signal in the two-antibody sandwich assay, in the format discussed above. Preferably, the amount of antibody immobilized on the membrane ranges from about 25 ng to about 1 μ g, and more preferably from about 50 ng to about 1 μ g. Such tests can typically be performed with a very small amount of biological sample.

The presence or absence of breast cancer in a patient may also be determined by evaluating the level of mRNA encoding a breast tumor-specific polypeptide as described herein within the biological sample (e.g., a biopsy, mastectomy and/or blood sample from a patient) relative to a predetermined cut-off value. Such an evaluation may be achieved using any of a variety of methods known to those of ordinary skill in the art such as, for example, *in situ* hybridization and amplification by polymerase chain reaction.

For example, polymerase chain reaction may be used to amplify sequences from cDNA prepared from RNA that is isolated from one of the above biological samples. Sequence-specific primers for use in such amplification may be designed based on the sequences provided in any one of SEQ ID NO: 1, 11-86, 142-298 301-303, 307, 313, 314, 316 and 317, and may be purchased or synthesized. In the case of B18Ag1, as noted herein, one suitable primer pair is B18Ag1-2 (5'ATG GCT ATT TTC GGG GGC TGA CA) (SEQ ID NO:126) and B18Ag1-3 (5'CCG GTA TCT CCT CGT GGG TAT T) (SEQ ID NO:127). The PCR reaction products may then be separated by gel electrophoresis and visualized according to methods well known to those of ordinary skill in the art. Amplification is typically performed on samples obtained from matched pairs of tissue (tumor and non-tumor tissue from the same individual) or from unmatched pairs of tissue (tumor and non-tumor tissue from different individuals). The amplification reaction is preferably performed on several dilutions of cDNA spanning two orders of magnitude. A two-fold or greater increase in expression in several dilutions of the tumor sample as compared to the same dilution of the non-tumor sample is considered positive.

As used herein, the term "primer/probe specific for a polynucleotide" means an oligonucleotide sequence that has at least about 80% identity, preferably at least about 90% and more preferably at least about 95%, identity to the polynucleotide in question, or an oligonucleotide sequence that is anti-sense to a sequence that has at least about 80% identity, preferably at least about 90% and more preferably at least about 95%, identity to the polynucleotide in question. Primers and/or probes which may be usefully employed in the inventive diagnostic methods preferably have at least about 10-40 nucleotides. In a preferred embodiment, the polymerase chain reaction primers comprise at least about 10 contiguous nucleotides of a polynucleotide that encodes one of the polypeptides disclosed herein or that is anti-sense to a sequence that encodes one of the polypeptides disclosed herein. Preferably, oligonucleotide probes for use in the inventive diagnostic methods comprise at least about 15 contiguous oligonucleotides of a polynucleotide that encodes one of the polypeptides disclosed herein or that is anti-sense to a sequence that encodes one of the polypeptides disclosed herein. Techniques for both PCR based assays and *in situ* hybridization assays are well known in the art.

Conventional RT-PCR protocols using agarose and ethidium bromide staining, while important in defining gene specificity, do not lend themselves to diagnostic kit development because of the time and effort required in making them quantitative (i.e., construction of saturation and/or titration curves), and their sample throughput. This problem is overcome by the development of procedures such as real time RT-PCR which allows for assays to be performed in single tubes, and in turn can be modified for use in 96 well plate formats. Instrumentation to perform such methodologies are available from Perkin Elmer/Applied Biosystems Division. Alternatively, other high throughput assays using labeled probes (e.g., digoxigenin) in combination with labeled (e.g., enzyme fluorescent, radioactive) antibodies to such probes can also be used in the development of 96 well plate assays.

In yet another method for determining the presence or absence of breast cancer in a patient, one or more of the breast tumor-specific polypeptides described may be used in a skin test. As used herein, a "skin test" is any assay performed directly on a patient in which a delayed-type hypersensitivity (DTH) reaction (such as swelling,

reddening or dermatitis) is measured following intradermal injection of one or more polypeptides as described above. Such injection may be achieved using any suitable device sufficient to contact the polypeptide or polypeptides with dermal cells of the patient, such as a tuberculin syringe or 1 mL syringe. Preferably, the reaction is
5 measured at least 48 hours after injection, more preferably 48-72 hours.

The DTH reaction is a cell-mediated immune response, which is greater in patients that have been exposed previously to a test antigen (*i.e.*, an immunogenic portion of a polypeptide employed, or a variant thereof). The response may be measured visually, using a ruler. In general, a response that is greater than about 0.5 cm in diameter,
10 preferably greater than about 5.0 cm in diameter, is a positive response, indicative of breast cancer.

The breast tumor-specific polypeptides described herein are preferably formulated, for use in a skin test, as pharmaceutical compositions containing at least one polypeptide and a physiologically acceptable carrier, such as water, saline, alcohol, or a
15 buffer. Such compositions typically contain one or more of the above polypeptides in an amount ranging from about 1 μ g to 100 μ g, preferably from about 10 μ g to 50 μ g in a volume of 0.1 mL. Preferably, the carrier employed in such pharmaceutical compositions is a saline solution with appropriate preservatives, such as phenol and/or Tween 80™.

20 In other aspects of the present invention, the progression and/or response to treatment of a breast cancer may be monitored by performing any of the above assays over a period of time, and evaluating the change in the level of the response (*i.e.*, the amount of polypeptide or mRNA detected or, in the case of a skin test, the extent of the immune response detected). For example, the assays may be performed every month to
25 every other month for a period of 1 to 2 years. In general, breast cancer is progressing in those patients in whom the level of the response increases over time. In contrast, breast cancer is not progressing when the signal detected either remains constant or decreases with time.

In further aspects of the present invention, the compounds described
30 herein may be used for the immunotherapy of breast cancer. In these aspects, the

compounds (which may be polypeptides, antibodies or polynucleotides) are preferably incorporated into pharmaceutical compositions or vaccines. Pharmaceutical compositions comprise one or more such compounds and a physiologically acceptable carrier. Vaccines may comprise one or more such compounds in combination with an immunostimulant, such as an adjuvant or a liposome (into which the compound is incorporated). An immunostimulant may be any substance that enhances or potentiates an immune response (antibody and/or cell-mediated) to an exogenous antigen. Examples of immunostimulants include adjuvants, biodegradable microspheres (*e.g.*, polylactic galactide) and liposomes (into which the compound is incorporated; *see e.g.*, Fullerton, U.S. Patent No. 4,235,877). Vaccine preparation is generally described in, for example, M.F. Powell and M.J. Newman, eds., "Vaccine Design (the subunit and adjuvant approach)," Plenum Press (NY, 1995). Pharmaceutical compositions and vaccines within the scope of the present invention may also contain other compounds, which may be biologically active or inactive. For example, one or more immunogenic portions of other tumor antigens may be present, either incorporated into a fusion polypeptide or as a separate compound, within the composition or vaccine.

Alternatively, a vaccine may contain DNA encoding one or more of the polypeptides as described above, such that the polypeptide is generated *in situ*. In such vaccines, the DNA may be present within any of a variety of delivery systems known to those of ordinary skill in the art, including nucleic acid expression systems, bacteria and viral expression systems. Appropriate nucleic acid expression systems contain the necessary DNA sequences for expression in the patient (such as a suitable promoter and terminating signal). Bacterial delivery systems involve the administration of a bacterium (such as *Bacillus-Calmette-Guerrin*) that expresses an immunogenic portion of the polypeptide on its cell surface. In a preferred embodiment, the DNA may be introduced using a viral expression system (*e.g.*, vaccinia or other pox virus, retrovirus, or adenovirus), which may involve the use of a non-pathogenic (defective), replication competent virus. Techniques for incorporating DNA into such expression systems are well known to those of ordinary skill in the art. The DNA may also be "naked," as described, for example, in Ulmer et al., *Science* 259:1745-1749 (1993), and reviewed by

Cohen, *Science* 259:1691-1692 (1993). The uptake of naked DNA may be increased by coating the DNA onto biodegradable beads, which are efficiently transported into the cells.

While any suitable carrier known to those of ordinary skill in the art may be employed in the pharmaceutical compositions of this invention, the type of carrier will vary depending on the mode of administration. For parenteral administration, such as subcutaneous injection, the carrier preferably comprises water, saline, alcohol, a fat, a wax or a buffer. For oral administration, any of the above carriers or a solid carrier, such as mannitol, lactose, starch, magnesium stearate, sodium saccharine, talcum, cellulose, glucose, sucrose, and magnesium carbonate, may be employed. Biodegradable microspheres (e.g., polylactate polyglycolate) may also be employed as carriers for the pharmaceutical compositions of this invention.

Any of a variety of immunostimulants may be employed in the vaccines of this invention. For example, an adjuvant may be included. Most adjuvants contain a substance designed to protect the antigen from rapid catabolism, such as aluminum hydroxide or mineral oil, and a stimulator of immune responses, such as lipid A, *Bordetella pertussis* or *Mycobacterium tuberculosis* derived proteins. Suitable adjuvants are commercially available as, for example, Freund's Incomplete Adjuvant and Complete Adjuvant (Difco Laboratories, Detroit, MI); Merck Adjuvant 65 (Merck and Company, Inc., Rahway, NJ); AS-2 (SmithKline Beecham, Philadelphia, PA); aluminum salts such as aluminum hydroxide gel (alum) or aluminum phosphate; salts of calcium, iron or zinc; an insoluble suspension of acylated tyrosine; acylated sugars; cationically or anionically derivatized polysaccharides; polyphosphazenes; biodegradable microspheres; monophosphoryl lipid A and quil A. Cytokines, such as GM-CSF or interleukin-2, -7, or -12, may also be used as adjuvants.

Within the vaccines provided herein, the adjuvant composition is preferably designed to induce an immune response predominantly of the Th1 type. High levels of Th1-type cytokines (e.g., IFN- γ , TNF α , IL-2 and IL-12) tend to favor the induction of cell mediated immune responses to an administered antigen. In contrast, high levels of Th2-type cytokines (e.g., IL-4, IL-5, IL-6 and IL-10) tend to favor the

induction of humoral immune responses. Following application of a vaccine as provided herein, a patient will support an immune response that includes Th1- and Th2-type responses. Within a preferred embodiment, in which a response is predominantly Th1-type, the level of Th1-type cytokines will increase to a greater extent than the level of Th2-type cytokines. The levels of these cytokines may be readily assessed using standard assays. For a review of the families of cytokines, see Mosmann and Coffman, *Ann. Rev. Immunol.* 7:145-173, 1989.

Preferred adjuvants for use in eliciting a predominantly Th1-type response include, for example, a combination of monophosphoryl lipid A, preferably 3-de-O-acylated monophosphoryl lipid A (3D-MPL), together with an aluminum salt. MPL adjuvants are available from Corixa Corporation (Seattle, WA; see US Patent Nos. 4,436,727; 4,877,611; 4,866,034 and 4,912,094). CpG-containing oligonucleotides (in which the CpG dinucleotide is unmethylated) also induce a predominantly Th1 response. Such oligonucleotides are well known and are described, for example, in WO 96/02555 and WO 99/33488. Immunostimulatory DNA sequences are also described, for example, by Sato et al., *Science* 273:352, 1996. Another preferred adjuvant is a saponin, preferably QS21 (Aquila Biopharmaceuticals Inc., Framingham, MA), which may be used alone or in combination with other adjuvants. For example, an enhanced system involves the combination of a monophosphoryl lipid A and saponin derivative, such as the combination of QS21 and 3D-MPL as described in WO 94/00153, or a less reactogenic composition where the QS21 is quenched with cholesterol, as described in WO 96/33739. Other preferred formulations comprise an oil-in-water emulsion and tocopherol. A particularly potent adjuvant formulation involving QS21, 3D-MPL and tocopherol in an oil-in-water emulsion is described in WO 95/17210.

Other preferred adjuvants include Montanide ISA 720 (Seppic, France), SAF (Chiron, California, United States), ISCOMS (CSL), MF-59 (Chiron), the SBAS series of adjuvants (e.g., SBAS-2 or SBAS-4, available from SmithKline Beecham, Rixensart, Belgium), Detox (Ribi ImmunoChem Research Inc., Hamilton, MT), RC-529 (Ribi ImmunoChem Research Inc., Hamilton, MT) and Aminoalkyl glucosaminide 4-phosphates (AGPs).

Any vaccine provided herein may be prepared using well known methods that result in a combination of antigen, immunostimulant and a suitable carrier or excipient. The compositions described herein may be administered as part of a sustained release formulation (*i.e.*, a formulation such as a capsule, sponge or gel (composed of polysaccharides, for example) that effects a slow release of compound following administration). Such formulations may generally be prepared using well known technology (*see, e.g.*, Coombes et al., *Vaccine* 14:1429-1438, 1996) and administered by, for example, oral, rectal or subcutaneous implantation, or by implantation at the desired target site. Sustained-release formulations may contain a polypeptide, polynucleotide or antibody dispersed in a carrier matrix and/or contained within a reservoir surrounded by a rate controlling membrane.

Carriers for use within such formulations are biocompatible, and may also be biodegradable; preferably the formulation provides a relatively constant level of active component release. Such carriers include microparticles of poly(lactide-co-glycolide), as well as polyacrylate, latex, starch, cellulose and dextran. Other delayed-release carriers include supramolecular biovectors, which comprise a non-liquid hydrophilic core (*e.g.*, a cross-linked polysaccharide or oligosaccharide) and, optionally, an external layer comprising an amphiphilic compound, such as a phospholipid (*see e.g.*, U.S. Patent No. 5,151,254 and PCT applications WO 94/20078, WO/94/23701 and WO 96/06638). The amount of active compound contained within a sustained release formulation depends upon the site of implantation, the rate and expected duration of release and the nature of the condition to be treated or prevented.

Any of a variety of delivery vehicles may be employed within pharmaceutical compositions and vaccines to facilitate production of an antigen-specific immune response that targets tumor cells. Delivery vehicles include antigen presenting cells (APCs), such as dendritic cells, macrophages, B cells, monocytes and other cells that may be engineered to be efficient APCs. Such cells may, but need not, be genetically modified to increase the capacity for presenting the antigen, to improve activation and/or maintenance of the T cell response, to have anti-tumor effects *per se* and/or to be immunologically compatible with the receiver (*i.e.*, matched HLA

haplotype). APCs may generally be isolated from any of a variety of biological fluids and organs, including tumor and peritumoral tissues, and may be autologous, allogeneic, syngeneic or xenogeneic cells.

Certain preferred embodiments of the present invention use dendritic cells or progenitors thereof as antigen-presenting cells. Dendritic cells are highly potent APCs (Banchereau and Steinman, *Nature* 392:245-251, 1998) and have been shown to be effective as a physiological adjuvant for eliciting prophylactic or therapeutic antitumor immunity (see Timmerman and Levy, *Ann. Rev. Med.* 50:507-529, 1999). In general, dendritic cells may be identified based on their typical shape (stellate *in situ*, with marked cytoplasmic processes (dendrites) visible *in vitro*), their ability to take up, process and present antigens with high efficiency and their ability to activate naïve T cell responses. Dendritic cells may, of course, be engineered to express specific cell-surface receptors or ligands that are not commonly found on dendritic cells *in vivo* or *ex vivo*, and such modified dendritic cells are contemplated by the present invention. As an alternative to dendritic cells, secreted vesicles antigen-loaded dendritic cells (called exosomes) may be used within a vaccine (see Zitvogel et al., *Nature Med.* 4:594-600, 1998).

Dendritic cells and progenitors may be obtained from peripheral blood, bone marrow, tumor-infiltrating cells, peritumoral tissues-infiltrating cells, lymph nodes, spleen, skin, umbilical cord blood or any other suitable tissue or fluid. For example, dendritic cells may be differentiated *ex vivo* by adding a combination of cytokines such as GM-CSF, IL-4, IL-13 and/or TNF α to cultures of monocytes harvested from peripheral blood. Alternatively, CD34 positive cells harvested from peripheral blood, umbilical cord blood or bone marrow may be differentiated into dendritic cells by adding to the culture medium combinations of GM-CSF, IL-3, TNF α , CD40 ligand, LPS, flt3 ligand and/or other compound(s) that induce differentiation, maturation and proliferation of dendritic cells.

Dendritic cells are conveniently categorized as "immature" and "mature" cells, which allows a simple way to discriminate between two well characterized phenotypes. However, this nomenclature should not be construed to exclude all possible

intermediate stages of differentiation. Immature dendritic cells are characterized as APC with a high capacity for antigen uptake and processing, which correlates with the high expression of Fcγ receptor and mannose receptor. The mature phenotype is typically characterized by a lower expression of these markers, but a high expression of cell surface molecules responsible for T cell activation such as class I and class II MHC, adhesion molecules (e.g., CD54 and CD11) and costimulatory molecules (e.g., CD40, CD80, CD86 and 4-1BB).

APCs may generally be transfected with a polynucleotide encoding a polypeptide of the present invention (or portion or other variant thereof) such that the polypeptide, or an immunogenic portion thereof, is expressed on the cell surface. Such transfection may take place *ex vivo*, and a composition or vaccine comprising such transfected cells may then be used for therapeutic purposes, as described herein. Alternatively, a gene delivery vehicle that targets a dendritic or other antigen presenting cell may be administered to a patient, resulting in transfection that occurs *in vivo*. *In vivo* and *ex vivo* transfection of dendritic cells, for example, may generally be performed using any methods known in the art, such as those described in WO 97/24447, or the gene gun approach described by Mahvi et al., *Immunology and cell Biology* 75:456-460, 1997. Antigen loading of dendritic cells may be achieved by incubating dendritic cells or progenitor cells with the polypeptide, DNA (naked or within a plasmid vector) or RNA; or with antigen-expressing recombinant bacterium or viruses (e.g., vaccinia, fowlpox, adenovirus or lentivirus vectors). Prior to loading, the polypeptide may be covalently conjugated to an immunological partner that provides T cell help (e.g., a carrier molecule). Alternatively, a dendritic cell may be pulsed with a non-conjugated immunological partner, separately or in the presence of the polypeptide.

Vaccines and pharmaceutical compositions may be presented in unit-dose or multi-dose containers, such as sealed ampoules or vials. Such containers are preferably hermetically sealed to preserve sterility of the formulation until use. In general, formulations may be stored as suspensions, solutions or emulsions in oily or aqueous vehicles. Alternatively, a vaccine or pharmaceutical composition may be stored in a freeze-dried condition requiring only the addition of a sterile liquid carrier

immediately prior to use.

The above pharmaceutical compositions and vaccines may be used, for example, for the therapy of breast cancer in a patient. As used herein, a "patient" refers to any warm-blooded animal, preferably a human. A patient may or may not be afflicted with breast cancer. Accordingly, the above pharmaceutical compositions and vaccines may be used to prevent the development of breast cancer or to treat a patient afflicted with breast cancer. In a preferred embodiment, the compounds are administered either prior to or following surgical removal of primary tumors and/or treatment by administration of radiotherapy and conventional chemotherapeutic drugs. To prevent or slow the development of breast cancer, a pharmaceutical composition or vaccine comprising one or more polypeptides as described herein may be administered to a patient. Alternatively, naked DNA or plasmid or viral vector encoding the polypeptide may be administered. For treating a patient with breast cancer, the pharmaceutical composition or vaccine may comprise one or more polypeptides, antibodies or polynucleotides complementary to DNA encoding a polypeptide as described herein (e.g., antisense RNA or antisense deoxyribonucleotide oligonucleotides).

Routes and frequency of administration, as well as dosage, will vary from individual to individual. In general, the pharmaceutical compositions and vaccines may be administered by injection (e.g., intracutaneous, intramuscular, intravenous or subcutaneous), intranasally (e.g., by aspiration) or orally. Between 1 and 10 doses may be administered for a 52-week period. Preferably, 6 doses are administered, at intervals of 1 month, and booster vaccinations may be given periodically thereafter. Alternate protocols may be appropriate for individual patients. A suitable dose is an amount of a compound that, when administered as described above, is capable of promoting an anti-tumor immune response. Such response can be monitored by measuring the anti-tumor antibodies in a patient or by vaccine-dependent generation of cytolytic effector cells capable of killing the patient's tumor cells *in vitro*. Such vaccines should also be capable of causing an immune response that leads to an improved clinical outcome (e.g., more frequent remissions, complete or partial or longer disease-free survival) in vaccinated patients as compared to non-vaccinated patients. In general, for pharmaceutical

compositions and vaccines comprising one or more polypeptides, the amount of each polypeptide present in a dose ranges from about 100 µg to 5 mg. Suitable dose sizes will vary with the size of the patient, but will typically range from about 0.1 mL to about 5 mL.

5 Polypeptides disclosed herein may also be employed in adoptive immunotherapy for the treatment of cancer. Adoptive immunotherapy may be broadly classified into either active or passive immunotherapy. In active immunotherapy, treatment relies on the *in vivo* stimulation of the endogenous host immune system to react against tumors with the administration of immune response-modifying agents (for
10 example, tumor vaccines, bacterial adjuvants, and/or cytokines).

In passive immunotherapy, treatment involves the delivery of biologic reagents with established tumor-immune reactivity (such as effector cells or antibodies) that can directly or indirectly mediate antitumor effects and does not necessarily depend on an intact host immune system. Examples of effector cells include T lymphocytes (for
15 example, CD8+ cytotoxic T-lymphocyte, CD4+ T-helper, tumor-infiltrating lymphocytes), killer cells (Natural Killer cells, lymphokine-activated killer cells), B cells, or antigen presenting cells (such as dendritic cells and macrophages) expressing the disclosed antigens. The polypeptides disclosed herein may also be used to generate antibodies or anti-idiotypic antibodies (as in U.S. Patent No. 4,918,164), for passive
20 immunotherapy.

The predominant method of procuring adequate numbers of T-cells for adoptive immunotherapy is to grow immune T-cells *in vitro*. Culture conditions for expanding single antigen-specific T-cells to several billion in number with retention of antigen recognition *in vivo* are well known in the art. These *in vitro* culture conditions
25 typically utilize intermittent stimulation with antigen, often in the presence of cytokines, such as IL-2, and non-dividing feeder cells. As noted above, the immunoreactive polypeptides described herein may be used to rapidly expand antigen-specific T cell cultures in order to generate sufficient number of cells for immunotherapy. In particular, antigen-presenting cells, such as dendritic, macrophage or B-cells, may be pulsed with
30 immunoreactive polypeptides or transfected with a polynucleotide sequence(s), using

standard techniques well known in the art. For cultured T-cells to be effective in therapy, the cultured T-cells must be able to grow and distribute widely and to survive long term *in vivo*. Studies have demonstrated that cultured T-cells can be induced to grow *in vivo* and to survive long term in substantial numbers by repeated stimulation
5 with antigen supplemented with IL-2 (see, for example, Cheever et al. *Ibid*).

The polypeptides disclosed herein may also be employed to generate and/or isolate tumor-reactive T-cells, which can then be administered to the patient. In one technique, antigen-specific T-cell lines may be generated by *in vivo* immunization with short peptides corresponding to immunogenic portions of the disclosed
10 polypeptides. The resulting antigen specific CD8+ CTL clones may be isolated from the patient, expanded using standard tissue culture techniques, and returned to the patient.

Alternatively, peptides corresponding to immunogenic portions of the polypeptides may be employed to generate tumor reactive T cell subsets by selective *in vitro* stimulation and expansion of autologous T cells to provide antigen-specific T cells
15 which may be subsequently transferred to the patient as described, for example, by Chang et al. (*Crit. Rev. Oncol. Hematol.*, 22(3), 213, 1996).

In another embodiment, syngeneic or autologous dendritic cells may be pulsed with peptides corresponding to at least an immunogenic portion of a polypeptide disclosed herein. The resulting antigen-specific dendritic cells may either be transferred
20 into a patient, or employed to stimulate T cells to provide antigen-specific T cells which may, in turn, be administered to a patient. The use of peptide-pulsed dendritic cells to generate antigen-specific T cells and the subsequent use of such antigen-specific T cells to eradicate tumors in a murine model has been demonstrated by Cheever et al. ("Therapy With Cultured T Cells: Principles Revisited," *Immunological Reviews*,
25 157:177, 1997).

Additionally vectors expressing the disclosed polynucleotides may be introduced into stem cells taken from the patient and clonally propagated *in vitro* for autologous transplant back into the same patient. In one embodiment, cells of the immune system, such as T cells, may be isolated from the peripheral blood of a patient, using a
30 commercially available cell separation system, such as CellPro Incorporated's (Bothell,

WA) CEPRATE™ system (see U.S. Patent No. 5,240,856; U.S. Patent No. 5,215,926; WO 89/06280; WO 91/16116 and WO 92/07243). The separated cells are stimulated with one or more of the immunoreactive polypeptides contained within a delivery vehicle, such as a microsphere, to provide antigen-specific T cells. The population of
5 tumor antigen-specific T cells is then expanded using standard techniques and the cells are administered back to the patient.

The following Examples are offered by way of illustration and not by way of limitation.

EXAMPLES

EXAMPLE 1

PREPARATION OF BREAST TUMOR-SPECIFIC cDNAs USING 15 DIFFERENTIAL DISPLAY RT-PCR

This Example illustrates the preparation of cDNA molecules encoding breast tumor-specific polypeptides using a differential display screen.

A. Preparation of B18Ag1 cDNA and Characterization of mRNA Expression

20 Tissue samples were prepared from breast tumor and normal tissue of a patient with breast cancer that was confirmed by pathology after removal from the patient. Normal RNA and tumor RNA was extracted from the samples and mRNA was isolated and converted into cDNA using a (dT)₁₂AG (SEQ ID NO:130) anchored 3' primer. Differential display PCR was then executed using a randomly chosen primer
25 (CTTCAACCTC) (SEQ ID NO:103). Amplification conditions were standard buffer containing 1.5 mM MgCl₂, 20 pmol of primer, 500 pmol dNTP, and 1 unit of *Taq* DNA polymerase (Perkin-Elmer, Branchburg, NJ). Forty cycles of amplification were performed using 94°C denaturation for 30 seconds, 42°C annealing for 1 minute, and 72°C extension for 30 seconds. An RNA fingerprint containing 76 amplified products was

obtained. Although the RNA fingerprint of breast tumor tissue was over 98% identical to that of the normal breast tissue, a band was repeatedly observed to be specific to the RNA fingerprint pattern of the tumor. This band was cut out of a silver stained gel, subcloned into the T-vector (Novagen, Madison, WI) and sequenced.

5 The sequence of the cDNA, referred to as B18Ag1, is provided in SEQ ID NO:1. A database search of GENBANK and EMBL revealed that the B18Ag1 fragment initially cloned is 77% identical to the endogenous human retroviral element S71, which is a truncated retroviral element homologous to the Simian Sarcoma Virus (SSV). S71 contains an incomplete *gag* gene, a portion of the *pol* gene and an LTR-like structure at
10 the 3' terminus (*see* Werner et al., *Virology* 174:225-238 (1990)). B18Ag1 is also 64% identical to SSV in the region corresponding to the P30 (*gag*) locus. B18Ag1 contains three separate and incomplete reading frames covering a region which shares considerable homology to a wide variety of *gag* proteins of retroviruses which infect mammals. In addition, the homology to S71 is not just within the *gag* gene, but spans
15 several kb of sequence including an LTR.

 B18Ag1-specific PCR primers were synthesized using computer analysis guidelines. RT-PCR amplification (94°C, 30 seconds; 60°C → 42°C, 30 seconds; 72°C, 30 seconds for 40 cycles) confirmed that B18Ag1 represents an actual mRNA sequence present at relatively high levels in the patient's breast tumor tissue. The primers used in
20 amplification were B18Ag1-1 (CTG CCT GAG CCA CAA ATG) (SEQ ID NO:128) and B18Ag1-4 (CCG GAG GAG GAA GCT AGA GGA ATA) (SEQ ID NO:129) at a 3.5 mM magnesium concentration and a pH of 8.5, and B18Ag1-2 (ATG GCT ATT TTC GGG GCC TGA CA) (SEQ ID NO:126) and B18Ag1-3 (CCG GTA TCT CCT CGT GGG TAT T) (SEQ ID NO:127) at 2 mM magnesium at pH 9.5. The same experiments
25 showed exceedingly low to nonexistent levels of expression in this patient's normal breast tissue (*see* Figure 1). RT-PCR experiments were then used to show that B18Ag1 mRNA is present in nine other breast tumor samples (from Brazilian and American patients) but absent in, or at exceedingly low levels in, the normal breast tissue corresponding to each cancer patient. RT-PCR analysis has also shown that the B18Ag1
30 transcript is not present in various normal tissues (including lymph node, myocardium

and liver) and present at relatively low levels in PBMC and lung tissue. The presence of B18Ag1 mRNA in breast tumor samples, and its absence from normal breast tissue, has been confirmed by Northern blot analysis, as shown in Figure 2.

The differential expression of B18Ag1 in breast tumor tissue was also confirmed by RNase protection assays. Figure 3 shows the level of B18Ag1 mRNA in various tissue types as determined in four different RNase protection assays. Lanes 1-12 represent various normal breast tissue samples, lanes 13-25 represent various breast tumor samples; lanes 26-27 represent normal prostate samples; lanes 28-29 represent prostate tumor samples; lanes 30-32 represent colon tumor samples; lane 33 represents normal aorta; lane 34 represents normal small intestine; lane 35 represents normal skin, lane 36 represents normal lymph node; lane 37 represents normal ovary; lane 38 represents normal liver; lane 39 represents normal skeletal muscle; lane 40 represents a first normal stomach sample, lane 41 represents a second normal stomach sample; lane 42 represents a normal lung; lane 43 represents normal kidney; and lane 44 represents normal pancreas. Interexperimental comparison was facilitated by including a positive control RNA of known β -actin message abundance in each assay and normalizing the results of the different assays with respect to this positive control.

RT-PCR and Southern Blot analysis has shown the B18Ag1 locus to be present in human genomic DNA as a single copy endogenous retroviral element. A genomic clone of approximately 12-18 kb was isolated using the initial B18Ag1 sequence as a probe. Four additional subclones were also isolated by XbaI digestion. Additional retroviral sequences obtained from the ends of the XbaI digests of these clones (located as shown in Figure 4) are shown as SEQ ID NO:3 - SEQ ID NO:10, where SEQ ID NO:3 shows the location of the sequence labeled 10 in Figure 4, SEQ ID NO:4 shows the location of the sequence labeled 11-29, SEQ ID NO:5 shows the location of the sequence labeled 3, SEQ ID NO:6 shows the location of the sequence labeled 6, SEQ ID NO:7 shows the location of the sequence labeled 12, SEQ ID NO:8 shows the location of the sequence labeled 13, SEQ ID NO:9 shows the location of the sequence labeled 14 and SEQ ID NO:10 shows the location of the sequence labeled 11-22.

Subsequent studies demonstrated that the 12-18 kb genomic clone contains a retroviral element of about 7.75 kb, as shown in Figures 5A and 5B. The sequence of this retroviral element is shown in SEQ ID NO: 141. The numbered line at the top of Figure 5A represents the sense strand sequence of the retroviral genomic clone.

5 The box below this line shows the position of selected restriction sites. The arrows depict the different overlapping clones used to sequence the retroviral element. The direction of the arrow shows whether the single-pass subclone sequence corresponded to the sense or anti-sense strand. Figure 5B is a schematic diagram of the retroviral element containing B18Ag1 depicting the organization of viral genes within the element. The
10 open boxes correspond to predicted reading frames, starting with a methionine, found throughout the element. Each of the six likely reading frames is shown, as indicated to the left of the boxes, with frames 1-3 corresponding to those found on the sense strand.

Using the cDNA of SEQ ID NO:1 as a probe, a longer cDNA was obtained (SEQ ID NO:227) which contains minor nucleotide differences (less than 1%)
15 compared to the genomic sequence shown in SEQ ID NO:141.

B. Preparation of cDNA Molecules Encoding Other Breast Tumor-Specific Polypeptides

Normal RNA and tumor RNA was prepared and mRNA was isolated and converted into cDNA using a (dT)₁₂AG anchored 3' primer, as described above.
20 Differential display PCR was then executed using the randomly chosen primers of SEQ ID NO: 87-125. Amplification conditions were as noted above, and bands observed to be specific to the RNA fingerprint pattern of the tumor were cut out of a silver stained gel, subcloned into either the T-vector (Novagen, Madison, WI) or the pCRII vector (Invitrogen, San Diego, CA) and sequenced. The sequences are provided in SEQ ID
25 NO:11 - SEQ ID NO:86. Of the 79 sequences isolated, 67 were found to be novel (SEQ ID NO:11-26 and 28-77) (*see also* Figures 6-20).

An extended DNA sequence (SEQ ID NO: 290) for the antigen B15Ag1 (originally identified partial sequence provided in SEQ ID NO: 27) was obtained in further studies. Comparison of the sequence of SEQ ID NO: 290 with those in the gene
30 bank as described above, revealed homology to the known human β -A activin gene.

Further studies led to the isolation of the full-length cDNA sequence for the antigen B21GT2 (also referred to as B311D; originally identified partial cDNA sequence provided in SEQ ID NO: 56). The full-length sequence is provided in SEQ ID NO: 307, with the corresponding amino acid sequence being provided in SEQ ID NO: 308.

- 5 Further studies led to the isolation of a splice variant of B311D. The B311D clone of SEQ ID NO: 316 was sequenced and a XhoI/NotI fragment from this clone was gel purified and 32P-cDTP labeled by random priming for use as a probe for further screening to obtain additional B311D gene sequence. Two fractions of a human breast tumor cDNA bacterial library were screened using standard techniques. One of the
- 10 clones isolated in this manner yielded additional sequence which includes a poly A+ tail. The determined cDNA sequence of this clone (referred to as B311D_BT1_1A) is provided in SEQ ID NO: 317. The sequences of SEQ ID NO: 316 and 317 were found to share identity over a 464 bp region, with the sequences diverging near the poly A+ sequence of SEQ ID NO: 317.

- 15 Subsequent studies identified an additional 146 sequences (SEQ ID NOS:142-289), of which 115 appeared to be novel (SEQ ID NOS:142, 143, 146-152, 154-166, 168-176, 178-192, 194-198, 200-204, 206, 207, 209-214, 216, 218, 219, 221-240, 243-245, 247, 250, 251, 253, 255, 257-266, 268, 269, 271-273, 275, 276, 278, 280, 281, 284, 288 and 291). To the best of the inventors' knowledge none of the previously
- 20 identified sequences have heretofore been shown to be expressed at a greater level in human breast tumor tissue than in normal breast tissue.

- In further studies, several different splice forms of the antigen B11Ag1 (also referred to as B305D) were isolated, with each of the various splice forms containing slightly different versions of the B11Ag1 coding frame. Splice junction
- 25 sequences define individual exons which, in various patterns and arrangements, make up the various splice forms. Primers were designed to examine the expression pattern of each of the exons using RT-PCR as described below. Each exon was found to show the same expression pattern as the original B11Ag1 clone, with expression being breast tumor-, normal prostate- and normal testis-specific. The determined cDNA sequences
- 30 for the isolated protein coding exons are provided in SEQ ID NO: 292-298, respectively.

The predicted amino acid sequences corresponding to the sequences of SEQ ID NO: 292 and 298 are provided in SEQ ID NO: 299 and 300. Additional studies using rapid amplification of cDNA ends (RACE), a 5' specific primer to one of the splice forms of B11Ag1 provided above and a breast adenocarcinoma, led to the isolation of three additional, related, splice forms referred to as isoforms B11C-15, B11C-8 and B11C-9,16. The determined cDNA sequences for these isoforms are provided in SEQ ID NO: 301-303, with the corresponding predicted amino acid sequences being provided in SEQ ID NO: 304-306.

In subsequent studies on B305D isoform A (cDNA sequence provided in SEQ ID NO: 292), the cDNA sequence (provided in SEQ ID NO: 313) was found to contain an additional guanine residue at position 884, leading to a frameshift in the open reading frame. The determined DNA sequence of this ORF is provided in SEQ ID NO: 314. This frameshift generates a protein sequence (provided in SEQ ID NO: 315) of 293 amino acids that contains the C-terminal domain common to the other isoforms of B305D but that differs in the N-terminal region.

EXAMPLE 2

PREPARATION OF B18AG1 DNA FROM HUMAN GENOMIC DNA

This Example illustrates the preparation of B18Ag1 DNA by amplification from human genomic DNA.

B18Ag1 DNA may be prepared from 250 ng human genomic DNA using 20 pmol of B18Ag1 specific primers, 500 pmol dNTPS and 1 unit of *Taq* DNA polymerase (Perkin Elmer, Branchburg, NJ) using the following amplification parameters: 94°C for 30 seconds denaturing, 30 seconds 60°C to 42°C touchdown annealing in 2°C increments every two cycles and 72°C extension for 30 seconds. The last increment (a 42°C annealing temperature) should cycle 25 times. Primers were selected using computer analysis. Primers synthesized were B18Ag1-1, B18Ag1-2, B18Ag1-3, and B18Ag1-4. Primer pairs that may be used are 1+3, 1+4, 2+3, and 2+4.

Following gel electrophoresis, the band corresponding to B18Ag1 DNA may be excised and cloned into a suitable vector.

EXAMPLE 3

5 PREPARATION OF B18AG1 DNA FROM BREAST TUMOR cDNA

This Example illustrates the preparation of B18Ag1 DNA by amplification from human breast tumor cDNA.

First strand cDNA is synthesized from RNA prepared from human breast
10 tumor tissue in a reaction mixture containing 500 ng poly A+ RNA, 200 pmol of the primer (T)₁₂AG (*i.e.*, TTT TTT TTT TTT AG) (SEQ ID NO: 130), 1X first strand reverse transcriptase buffer, 6.7 mM DTT, 500 mmol dNTPs, and 1 unit AMV or MMLV reverse transcriptase (from any supplier, such as Gibco-BRL (Grand Island, NY)) in a final volume of 30 μ l. After first strand synthesis, the cDNA is diluted approximately 25
15 fold and 1 μ l is used for amplification as described in Example 2. While some primer pairs can result in a heterogeneous population of transcripts, the primers B18Ag1-2 (5'ATG GCT ATT TTC GGG GGC TGA CA) (SEQ ID NO: 126) and B18Ag1-3 (5'CCG GTA TCT CCT CGT GGG TAT T) (SEQ ID NO: 127) yield a single 151 bp amplification product.

20

EXAMPLE 4

IDENTIFICATION OF B-CELL AND T-CELL EPITOPES OF B18AG1

This Example illustrates the identification of B18Ag1 epitopes.

25 The B18Ag1 sequence can be screened using a variety of computer algorithms. To determine B-cell epitopes, the sequence can be screened for hydrophobicity and hydrophilicity values using the method of Hopp, *Prog. Clin. Biol. Res.* 172B:367-77 (1985) or, alternatively, Cease et al., *J. Exp. Med.* 164:1779-84 (1986) or Spouge et al., *J. Immunol.* 138:204-12 (1987). Additional Class II MHC (antibody or
30 B-cell) epitopes can be predicted using programs such as AMPHI (*e.g.*, Margalit et al., *J.*

Immunol. 138:2213 (1987)) or the methods of Rothbard and Taylor (e.g., *EMBO J.* 7:93 (1988)).

Once peptides (15-20 amino acids long) are identified using these techniques, individual peptides can be synthesized using automated peptide synthesis equipment (available from manufacturers such as Perkin Elmer/Applied Biosystems Division, Foster City, CA) and techniques such as Merrifield synthesis. Following synthesis, the peptides can be used to screen sera harvested from either normal or breast cancer patients to determine whether patients with breast cancer possess antibodies reactive with the peptides. Presence of such antibodies in breast cancer patient would confirm the immunogenicity of the specific B-cell epitope in question. The peptides can also be tested for their ability to generate a serologic or humoral immune response in animals (mice, rats, rabbits, chimps etc.) following immunization *in vivo*. Generation of a peptide-specific antiserum following such immunization further confirms the immunogenicity of the specific B-cell epitope in question.

To identify T-cell epitopes, the B18Ag1 sequence can be screened using different computer algorithms which are useful in identifying 8-10 amino acid motifs within the B18Ag1 sequence which are capable of binding to HLA Class I MHC molecules. (see, e.g., Rammensee et al., *Immunogenetics* 41:178-228 (1995)). Following synthesis such peptides can be tested for their ability to bind to class I MHC using standard binding assays (e.g., Sette et al., *J. Immunol.* 153:5586-92 (1994)) and more importantly can be tested for their ability to generate antigen reactive cytotoxic T-cells following *in vitro* stimulation of patient or normal peripheral mononuclear cells using, for example, the methods of Bakker et al., *Cancer Res.* 55:5330-34 (1995); Visseren et al., *J. Immunol.* 154:3991-98 (1995); Kawakami et al., *J. Immunol.* 154:3961-68 (1995); and Kast et al., *J. Immunol.* 152:3904-12 (1994). Successful *in vitro* generation of T-cells capable of killing autologous (bearing the same Class I MHC molecules) tumor cells following *in vitro* peptide stimulation further confirms the immunogenicity of the B18Ag1 antigen. Furthermore, such peptides may be used to generate murine peptide and B18Ag1 reactive cytotoxic T-cells following *in vivo* immunization in mice rendered

transgenic for expression of a particular human MHC Class I haplotype (Vitiello et al., *J. Exp. Med.* 173:1007-15 (1991)).

A representative list of predicted B18Ag1 B-cell and T-cell epitopes, broken down according to predicted HLA Class I MHC binding antigen, is shown below:

5

Predicted Th Motifs (B-cell epitopes) (SEQ ID NOS.: 131-133)

SSGGRTFDDFHRYLLVGI

QGAAQKPINLSKXIEVVQGHDE

SPGVFLEHLQEAYRIYTPFDLSA

10

Predicted HLA A2.1 Motifs (T-cell epitopes) (SEQ ID NOS.: 134-140)

YLLVGIQGA

GAAQKPINL

NLSKXIEVV

15

EVVQGHDES

HLQEAYRIY

NLAFVAQAA

FVAQAAPDS

20

EXAMPLE 5

IDENTIFICATION OF T-CELL EPITOPES OF B11Ag1

This Example illustrates the identification of B11Ag1 (also referred to as B305D) epitopes. Four peptides, referred to as B11-8, B11-1, B11-5 and B11-12 (SEQ ID NO: 309-312, respectfully) were derived from the B11Ag1 gene.

25

Human CD8 T cells were primed *in vitro* to the peptide B11-8 using dendritic cells according to the protocol of Van Tsai et al. (*Critical Reviews in Immunology* 18:65-75, 1998). The resulting CD8 T cell cultures were tested for their ability to recognize the B11-8 peptide or a negative control peptide, presented by the B-LCL line, JY. Briefly, T cells were incubated with autologous monocytes in the presence of 10 ug/ml peptide, 10 ng/ml IL-7 and 10 ug/ml IL-2, and assayed for their ability to

30

specifically lyse target cells in a standard 51-Cr release assay. As shown in Fig. 22, the bulk culture line demonstrated strong recognition of the B11-8 peptide with weaker recognition of the peptide B11-1.

A clone from this CTL line was isolated following rapid expansion using the monoclonal antibody OKT3 and human IL-2. As shown in Fig. 23, this clone (referred to as A1), in addition to being able to recognize specific peptide, recognized JY LCL transduced with the B11Ag1 gene. This data demonstrates that B11-8 is a naturally processed epitope of the B11Ag1 gene. In addition these T cells were further found to recognize and lyse, in an HLA-A2 restricted manner, an established tumor cell line naturally expressing B11Ag1 (Fig. 24). The T cells strongly recognize a lung adenocarcinoma (LT-140-22) naturally expressing B11Ag1 transduced with HLA-A2, as well as an A2+ breast carcinoma (CAMA-1) transduced with B11Ag1, but not untransduced lines or another negative tumor line (SW620).

These data clearly demonstrate that these human T cells recognize not only B11-specific peptides but also transduced cells, as well as naturally expressing tumor lines.

CTL lines raised against the antigens B11-5 and B11-12, using the procedures described above, were found to recognize corresponding peptide-coated targets.

Example 6

CHARACTERIZATION OF BREAST TUMOR GENES DISCOVERED BY
DIFFERENTIAL DISPLAY PCR

5 The specificity and sensitivity of the breast tumor genes discovered by differential display PCR were determined using RT-PCR. This procedure enabled the rapid evaluation of breast tumor gene mRNA expression semiquantitatively without using large amounts of RNA. Using gene specific primers, mRNA expression levels in a variety of tissues were examined, including 8 breast tumors, 5 normal breasts, 2 prostate
10 tumors, 2 colon tumors, 1 lung tumor, and 14 other normal adult human tissues, including normal prostate, colon, kidney, liver, lung, ovary, pancreas, skeletal muscle, skin, stomach and testes.

 To ensure the semiquantitative nature of the RT-PCR, β -actin was used as internal control for each of the tissues examined. Serial dilutions of the first strand
15 cDNAs were prepared and RT-PCR assays performed using β -actin specific primers. A dilution was then selected that enabled the linear range amplification of β -actin template, and which was sensitive enough to reflect the difference in the initial copy number. Using this condition, the β -actin levels were determined for each reverse transcription reaction from each tissue. DNA contamination was minimized by DNase treatment and
20 by assuring a negative result when using first strand cDNA that was prepared without adding reverse transcriptase.

 Using gene specific primers, the mRNA expression levels were determined in a variety of tissues. To date, 38 genes have been successfully examined by RT-PCR, five of which exhibit good specificity and sensitivity for breast tumors
25 (B15AG-1, B31GA1b, B38GA2a, B11A1a and B18AG1a). Figures 21A and 21B depict the results for three of these genes: B15AG-1 (SEQ ID NO:27), B31GA1b (SEQ ID NO:148) and B38GA2a (SEQ ID NO. 157). Table I summarizes the expression level of all the genes tested in normal breast tissue and breast tumors, and also in other tissues.

TABLE I

Percentage of Breast Cancer Antigens that are Expressed in Various Tissues

5	Breast Tissues	Over-expressed in Breast Tumors	84%
		Equally Expressed in Normals and Tumor	16%
10	Other Tissues	Over-expressed in Breast Tumors but not in any Normal Tissues	9%
		Over-expressed in Breast Tumors but Expressed in Some Normal Tissues	30%
15		Over-expressed in Breast Tumors but Equally Expressed in All Other Tissues	61%

20 From the foregoing, it will be appreciated that, although specific embodiments of the invention have been described herein for the purpose of illustration, various modifications may be made without deviating from the spirit and scope of the invention.

CLAIMS

1. An isolated polypeptide, comprising at least an immunogenic portion of a protein, or a variant thereof, wherein the protein comprises an amino acid
5 sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

- 10 (a) sequences recited in SEQ ID NOs: 1, 3-26, 28-77, 142, 143, 146-152, 154-166, 168-176, 178-192, 194-198, 200-204, 206, 207, 209-214, 216, 218, 219, 221-240, 243-245, 247, 250, 251, 253, 255, 257-266, 268, 269, 271-273, 275, 276, 278, 280, 281, 284, 288, 291-298, 301-303, 307, 313, 314, 316 and 317;
- 15 (b) sequences that hybridize to a sequence recited in any one of SEQ ID NOs: 1, 3-26, 28-77, 142, 143, 146-152, 154-166, 168-176, 178-192, 194-198, 200-204, 206, 207, 209-214, 216, 218, 219, 221-240, 243-245, 247, 250, 251, 253, 255, 257-266, 268, 269, 271-273, 275, 276, 278, 280, 281, 284, 288, 291-298, 301-303, 307, 313, 314, 316 and 317 under moderately stringent conditions; and
- (c) complements of sequences of (a) or (b).

20 2. An isolated polypeptide according to claim 1, wherein the polypeptide comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOs: 1, 3-26, 28-77, 142, 143, 146-152, 154-166, 168-176, 178-192, 194-198, 200-204, 206, 207, 209-214, 216, 218, 219, 221-240, 243-245, 247, 250, 251, 253, 255, 257-266, 268, 269, 271-273, 275, 276, 278, 280, 281,
25 284, 288, 291-298, 301-303, 307, 313, 314, 316 and 317 or a complement of any of the foregoing polynucleotide sequences.

3. An isolated polypeptide comprising a sequence recited in any one of SEQ ID NOs: 299, 300, 304-306, 308 and 315.

30 4. An isolated polynucleotide encoding at least 15 amino acid

residues of a protein, or a variant thereof that differs in one or more substitutions, deletions, additions and/or insertions such that the ability of the variant to react with antigen-specific antisera is not substantially diminished, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide comprising a
5 sequence recited in any one of SEQ ID NOs: 1, 3-26, 28-77, 142, 143, 146-152, 154-166, 168-176, 178-192, 194-198, 200-204, 206, 207, 209-214, 216, 218, 219, 221-240, 243-245, 247, 250, 251, 253, 255, 257-266, 268, 269, 271-273, 275, 276, 278, 280, 281, 284, 288, 291-298, 301-303, 307, 313, 314, 316 and 317 or a complement of any of the foregoing sequences.

10

5. An isolated polynucleotide encoding a protein, or a variant thereof, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide comprising a sequence recited in any one of SEQ ID NOs: 1, 3-26, 28-77, 142, 143, 146-152, 154-166, 168-176, 178-192, 194-198, 200-204, 206, 207, 209-
15 214, 216, 218, 219, 221-240, 243-245, 247, 250, 251, 253, 255, 257-266, 268, 269, 271-273, 275, 276, 278, 280, 281, 284, 288, 291-298, 301-303, 307, 313, 314, 316 and 317 or a complement of any of the foregoing sequences.

20

6. An isolated polynucleotide, comprising a sequence recited in any one of SEQ ID Nos: 1, 3-26, 28-77, 142, 143, 146-152, 154-166, 168-176, 178-192, 194-198, 200-204, 206, 207, 209-214, 216, 218, 219, 221-240, 243-245, 247, 250, 251, 253, 255, 257-266, 268, 269, 271-273, 275, 276, 278, 280, 281, 284, 288, 291-298, 301-303, 307, 313, 314, 316 and 317.

25

7. An isolated polynucleotide, comprising a sequence that hybridizes to a sequence recited in any one of SEQ ID NOs: 1, 3-26, 28-77, 142, 143, 146-152, 154-166, 168-176, 178-192, 194-198, 200-204, 206, 207, 209-214, 216, 218, 219, 221-240, 243-245, 247, 250, 251, 253, 255, 257-266, 268, 269, 271-273, 275, 276, 278, 280, 281, 284, 288, 291-298, 301-303, 307, 313, 314, 316 and 317 under
30 moderately stringent conditions.

8. An isolated polynucleotide complementary to a polynucleotide according to any one of claims 4-7.
9. An expression vector, comprising a polynucleotide according to
5 any one of claims claim 4-8.
10. A host cell transformed or transfected with an expression vector according to claim 9.
- 10 11. An isolated antibody, or antigen-binding fragment thereof, that specifically binds to a protein that comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOs: 1, 3-26, 28-77, 142, 143, 146-152, 154-166, 168-176, 178-192, 194-198, 200-204, 206, 207, 209-214, 216, 218, 219, 221-240, 243-245, 247, 250, 251, 253, 255, 257-266, 268, 269, 271-273, 275, 276,
15 278, 280, 281, 284, 288, 291-298, 301-303, 307, 313, 314, 316 and 317 or a complement of any of the foregoing polynucleotide sequences.
12. A fusion protein, comprising at least one polypeptide according to claim 1.
- 20 13. A fusion protein according to claim 12, wherein the fusion protein comprises an expression enhancer that increases expression of the fusion protein in a host cell transfected with a polynucleotide encoding the fusion protein.
- 25 14. A fusion protein according to claim 12, wherein the fusion protein comprises a T helper epitope that is not present within the polypeptide of claim 1.
- 30 15. A fusion protein according to claim 12, wherein the fusion protein comprises an affinity tag.

16. An isolated polynucleotide encoding a fusion protein according to claim 12.

17. A pharmaceutical composition, comprising a physiologically acceptable carrier and at least one component selected from the group consisting of:

- (a) a polypeptide according to claim 1;
- (b) a polynucleotide according to claim 4;
- (c) an antibody according to claim 11;
- (d) a fusion protein according to claim 12; and
- (e) a polynucleotide according to claim 16.

18. A vaccine comprising an immunostimulant and at least one component selected from the group consisting of:

- (a) a polypeptide according to claim 1;
- (b) a polynucleotide according to claim 4;
- (c) an antibody according to claim 11;
- (d) a fusion protein according to claim 12; and
- (e) a polynucleotide according to claim 16.

19. A vaccine according to claim 18, wherein the immunostimulant is an adjuvant.

20. A vaccine according to any claim 18, wherein the immunostimulant induces a predominantly Type I response.

25

21. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a pharmaceutical composition according to claim 17.

30

22. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a vaccine according to

claim 18.

23. A pharmaceutical composition comprising an antigen-presenting cell that expresses a polypeptide according to claim 1, in combination with a
5 pharmaceutically acceptable carrier or excipient.

24. A pharmaceutical composition according to claim 23, wherein the antigen presenting cell is a dendritic cell or a macrophage.

10 25. A vaccine comprising an antigen-presenting cell that expresses a polypeptide comprising at least an immunogenic portion of a protein, or a variant thereof, wherein the protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(a) sequences recited in SEQ ID NOs: 1, 3-26, 28-86, 142-253, 255-
15 298, 301-303, 307, 313, 314, 316 and 317;

(b) sequences that hybridize to a sequence recited in any one of SEQ ID NOs: 1, 3-26, 28-86, 142-253, 255-298, 301-303, 307, 313, 314, 316 and 317 under moderately stringent conditions; and

(c) complements of sequences of (i) or (ii);
20 in combination with an immunostimulant.

26. A vaccine according to claim 25, wherein the immunostimulant is an adjuvant.

25 27. A vaccine according to claim 25, wherein the immunostimulant induces a predominantly Type I response.

28. A vaccine according to claim 25, wherein the antigen-presenting cell is a dendritic cell.

30

29. A method for inhibiting the development of a cancer in a patient,

comprising administering to a patient an effective amount of an antigen-presenting cell that expresses a polypeptide comprising at least an immunogenic portion of a protein, or a variant thereof, wherein the protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

5 (a) sequences recited in SEQ ID NOs: 1, 3-26, 28-86, 142-253, 255-298, 301-303, 307, 313, 314, 316 and 317;

(b) sequences that hybridize to a sequence recited in any one of SEQ ID NOs: 1, 3-26, 28-86, 142-253, 255-298, 301-303, 307, 313, 314, 316 and 317 under moderately stringent conditions; and

10 (c) complements of sequences encoded by a polynucleotide recited in any one of SEQ ID NOs: 1, 3-26, 28-86, 142-253, 255-298, 301-303, 307, 313, 314, 316 and 317;

and thereby inhibiting the development of a cancer in the patient.

15 30. A method according to claim 29, wherein the antigen-presenting cell is a dendritic cell.

31. A method according to any one of claims 21, 22 and 29, wherein the cancer is breast cancer.

20 32. A method for removing tumor cells from a biological sample, comprising contacting a biological sample with T cells that specifically react with a protein, wherein the protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

25 (i) polynucleotides recited in any one of SEQ ID NOs: 1, 3-26, 28-86, 142-253, 255-298, 301-303, 307, 313, 314, 316 and 317; and

(ii) complements of the foregoing polynucleotides;

wherein the step of contacting is performed under conditions and for a time sufficient to permit the removal of cells expressing the antigen from the sample.

30 33. A method according to claim 32, wherein the biological sample is

blood or a fraction thereof.

34. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient a biological sample treated according to the
5 method of claim 32.

35. A method for stimulating and/or expanding T cells specific for a protein, comprising contacting T cells with at least one component selected from the group consisting of:

10 (a) polypeptides comprising at least an immunogenic portion of a protein, or a variant thereof, wherein the protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(i) sequences recited in SEQ ID NOs: 1, 3-26, 28-86, 142-253, 255-298, 301-303, 307, 313, 314, 316 and 317;

15 (ii) sequences that hybridize to a sequence recited in any one of SEQ ID NOs: 1, 3-26, 28-86, 142-253, 255-298, 301-303, 307, 313, 314, 316 and 317 under moderately stringent conditions; and

(iii) complements of sequences of (i) or (ii);

(b) polynucleotides encoding a polypeptide of (a); and

20 (c) antigen presenting cells that express a polypeptide of (a);

under conditions and for a time sufficient to permit the stimulation and/or expansion of T cells.

36. An isolated T cell population, comprising T cells prepared
25 according to the method of claim 35.

37. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a T cell population according to claim 36.

30

38. A method for inhibiting the development of a cancer in a patient,

comprising the steps of:

(a) incubating CD4⁺ and/or CD8⁺ T cells isolated from a patient with at least one component selected from the group consisting of:

5 (i) polypeptides comprising at least an immunogenic portion of a protein, or a variant thereof, wherein the protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(1) sequences recited in SEQ ID NOs: 1, 3-26, 28-86, 142-253, 255-298, 301-303, 307, 313, 314, 316 and 317;

10 (2) sequences that hybridize to a sequence recited in any one of SEQ ID NOs: 1, 3-26, 28-86, 142-253, 255-298, 301-303, 307, 313, 314, 316 and 317 under moderately stringent conditions; and

(3) complements of sequences of (1) or (2);

(ii) polynucleotides encoding a polypeptide of (i); and

15 (iii) antigen presenting cells that expresses a polypeptide of (i);

such that T cells proliferate; and

(b) administering to the patient an effective amount of the proliferated T cells, and thereby inhibiting the development of a cancer in the patient.

20

39. A method for inhibiting the development of a cancer in a patient, comprising the steps of:

(a) incubating CD4⁺ and/or CD8⁺ T cells isolated from a patient with at least one component selected from the group consisting of:

25 (i) polypeptides comprising at least an immunogenic portion of a protein, or a variant thereof, wherein the protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

30 (1) sequences recited in SEQ ID NOs: 1, 3-26, 28-86, 142-253, 255-298, 301-303, 307, 313, 314, 316 and 317;

(2) sequences that hybridize to a sequence recited in

any one of SEQ ID NOs: 1, 3-26, 28-86, 142-253, 255-298, 301-303, 307, 313, 314, 316 and 317 under moderately stringent conditions; and

(3) complements of sequences of (1) or (2);

(ii) polynucleotides encoding a polypeptide of (i); and

5 (iii) antigen presenting cells that express a polypeptide of (i);

such that T cells proliferate;

(b) cloning at least one proliferated cell to provide cloned T cells;

and

10 (c) administering to the patient an effective amount of the cloned T cells, and thereby inhibiting the development of a cancer in the patient.

40. A method for determining the presence or absence of a cancer in a patient, comprising the steps of:

15 (a) contacting a biological sample obtained from a patient with a binding agent that binds to a protein, wherein the protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOs: 1, 3-26, 28-86, 142-253, 255-298, 301-303, 307, 313, 314, 316 and 317 or a complement of any of the foregoing polynucleotide sequences;

20 (b) detecting in the sample an amount of polypeptide that binds to the binding agent; and

(c) comparing the amount of polypeptide to a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient.

25 41. A method according to claim 40, wherein the binding agent is an antibody.

42. A method according to claim 43, wherein the antibody is a monoclonal antibody.

30

43. A method according to claim 40, wherein the cancer is breast

cancer.

44. A method for monitoring the progression of a cancer in a patient, comprising the steps of:

- 5 (a) contacting a biological sample obtained from a patient at a first point in time with a binding agent that binds to a protein, wherein the protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOs: 1, 3-26, 28-86, 142-253, 255-298, 301-303, 307, 313, 314, 316 and 317 or a complement of any of the foregoing polynucleotide sequences;
- 10 (b) detecting in the sample an amount of polypeptide that binds to the binding agent;
- (c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and
- (d) comparing the amount of polypeptide detected in step (c) to the
15 amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

45. A method according to claim 44, wherein the binding agent is an antibody.

20 46. A method according to claim 45, wherein the antibody is a monoclonal antibody.

47. A method according to claim 44, wherein the cancer is a breast
25 cancer.

48. A method for determining the presence or absence of a cancer in a patient, comprising the steps of:

- (a) contacting a biological sample obtained from a patient with an
30 oligonucleotide that hybridizes to a polynucleotide that encodes a protein, wherein the protein comprises an amino acid sequence that is encoded by a polynucleotide sequence

recited in any one of SEQ ID NO: 1, 3-26, 28-86, 142-253, 255-298, 301-303, 307, 313, 314, 316 and 317 or a complement of any of the foregoing polynucleotide sequences;

(b) detecting in the sample an amount of a polynucleotide that hybridizes to the oligonucleotide; and

5 (c) comparing the amount of polynucleotide that hybridizes to the oligonucleotide to a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient.

49. A method according to claim 48, wherein the amount of
10 polynucleotide that hybridizes to the oligonucleotide is determined using a polymerase chain reaction.

50. A method according to claim 48, wherein the amount of
15 polynucleotide that hybridizes to the oligonucleotide is determined using a hybridization assay.

51. A method for monitoring the progression of a cancer in a patient, comprising the steps of:

(a) contacting a biological sample obtained from a patient with an
20 oligonucleotide that hybridizes to a polynucleotide that encodes a protein, wherein the protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NO: 1, 3-26, 28-86, 142-253, 255-298, 301-303, 307, 313, 314, 316 and 317 or a complement of any of the foregoing polynucleotide sequences;

(b) detecting in the sample an amount of a polynucleotide that
25 hybridizes to the oligonucleotide;

(c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and

(d) comparing the amount of polynucleotide detected in step (c) to the amount detected in step (b) and therefrom monitoring the progression of the cancer
30 in the patient.

52. A method according to claim 51, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a polymerase chain reaction.

5 53. A method according to claim 51, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a hybridization assay.

54. A diagnostic kit, comprising:
10 (a) one or more antibodies according to claim 11; and
(b) a detection reagent comprising a reporter group.

55. A kit according to claim 54, wherein the antibodies are immobilized on a solid support.

15

56. A kit according to claim 54, wherein the detection reagent comprises an anti-immunoglobulin, protein G, protein A or lectin.

57. A kit according to claim 54, wherein the reporter group is
20 selected from the group consisting of radioisotopes, fluorescent groups, luminescent groups, enzymes, biotin and dye particles.

58. An oligonucleotide comprising 10 to 40 contiguous nucleotides that hybridize under moderately stringent conditions to a polynucleotide that encodes a
25 protein, wherein the protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOs: 1, 3-26, 28-77, 142, 143, 146-152, 154-166, 168-176, 178-192, 194-198, 200-204, 206, 207, 209-214, 216, 218, 219, 221-240, 243-245, 247, 250, 251, 253, 255, 257-266, 268, 269, 271-273, 275, 276, 278, 280, 281, 284, 288, 291-298, 301-303, 307, 313, 314, 316 and 317 or a
30 complement of any of the foregoing polynucleotides.

59. A oligonucleotide according to claim 58, wherein the oligonucleotide comprises 10-40 contiguous nucleotides recited in any one of SEQ ID Nos: 1, 3-26, 28-77, 142, 143, 146-152, 154-166, 168-176, 178-192, 194-198, 200-204, 206, 207, 209-214, 216, 218, 219, 221-240, 243-245, 247, 250, 251, 253, 255, 257-266, 268, 269, 271-273, 275, 276, 278, 280, 281, 284, 288, 291-298, 301-303, 307, 313, 314, 316 and 317.

60. A diagnostic kit, comprising:

- 10 (a) an oligonucleotide according to claim 59; and
(b) a diagnostic reagent for use in a polymerase chain reaction or hybridization assay.

1/25

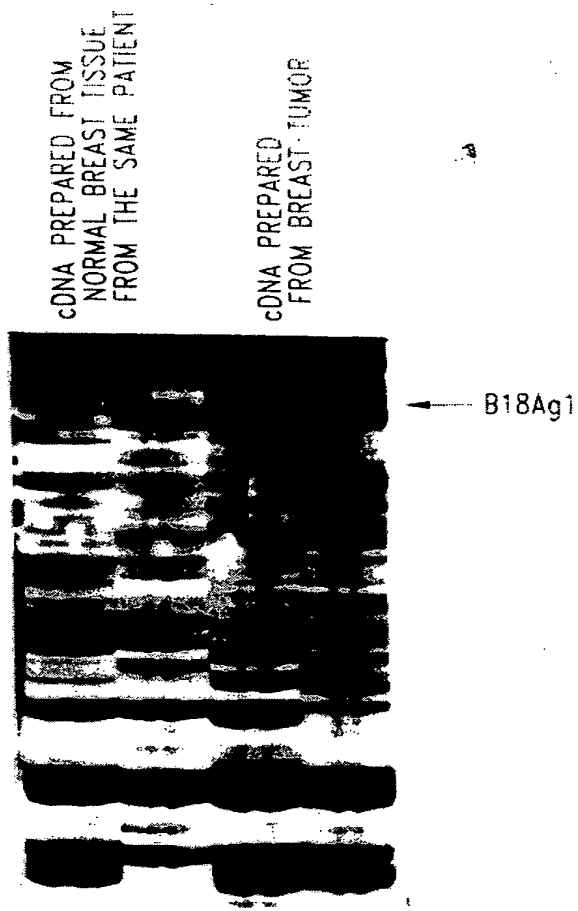


Fig. 1

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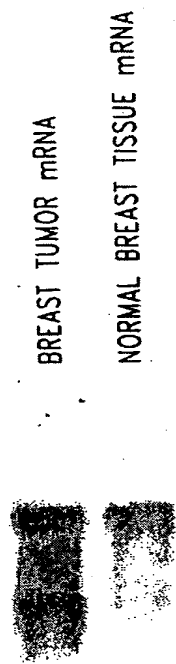
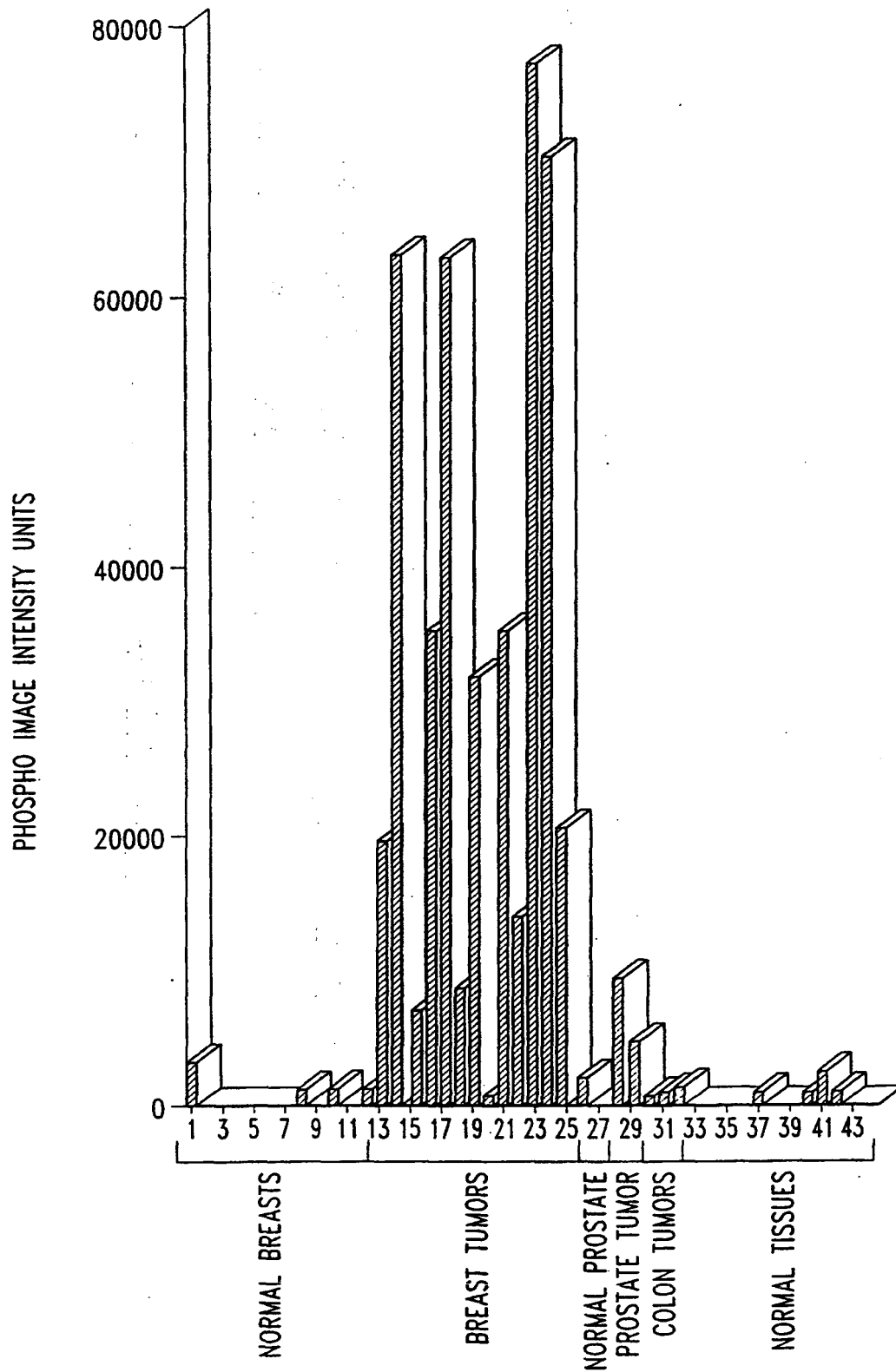


Fig. 2

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*Fig. 3*

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GENOMIC CLONE MAP

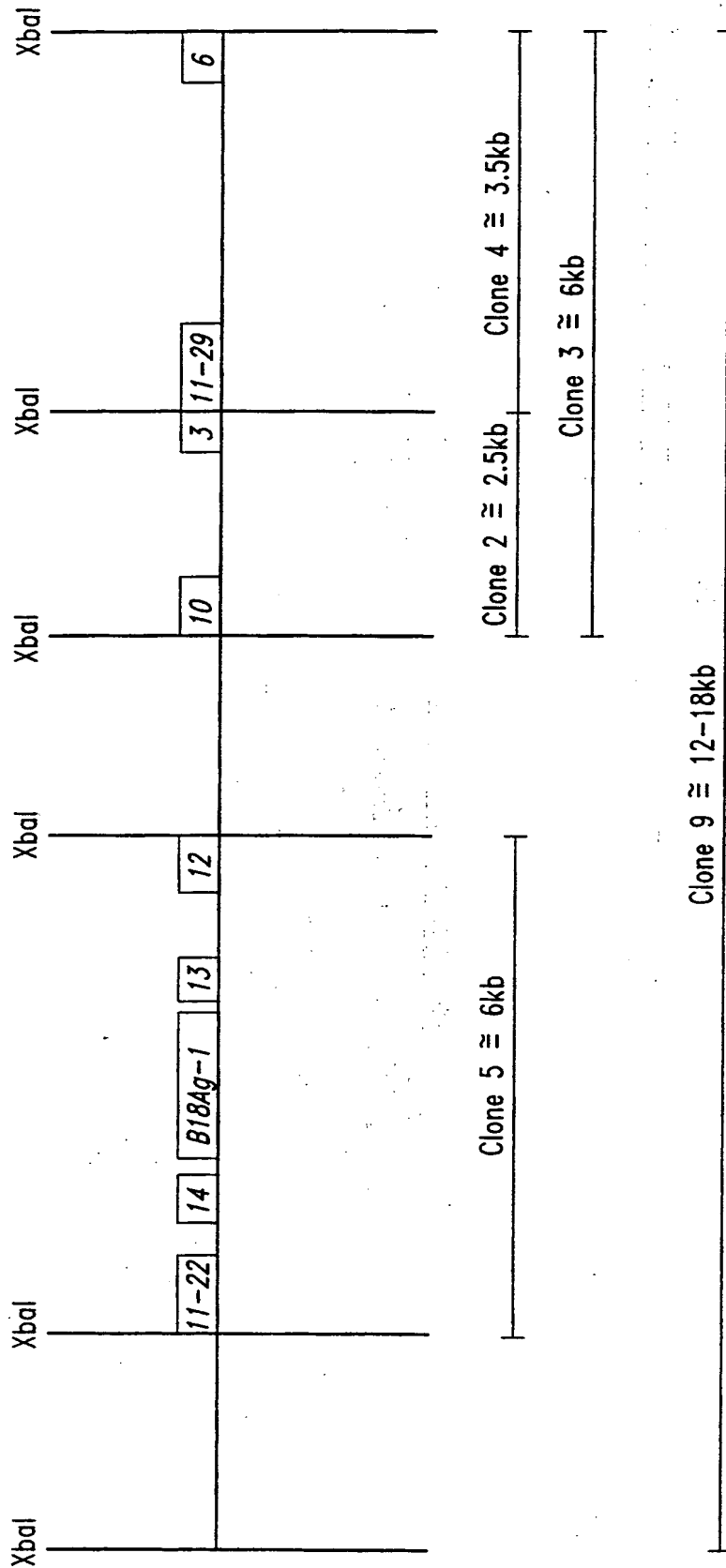


Fig. 4

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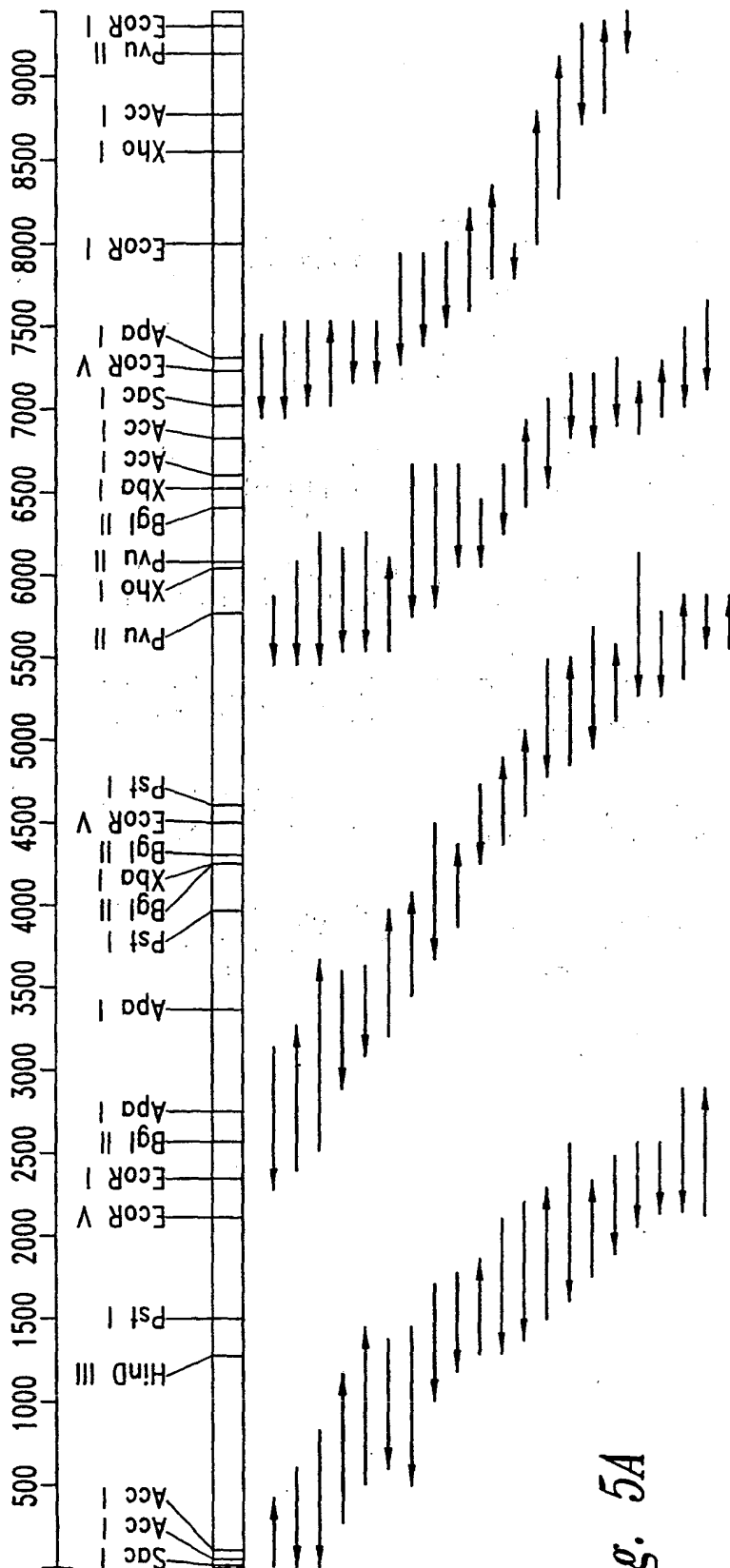


Fig. 5A

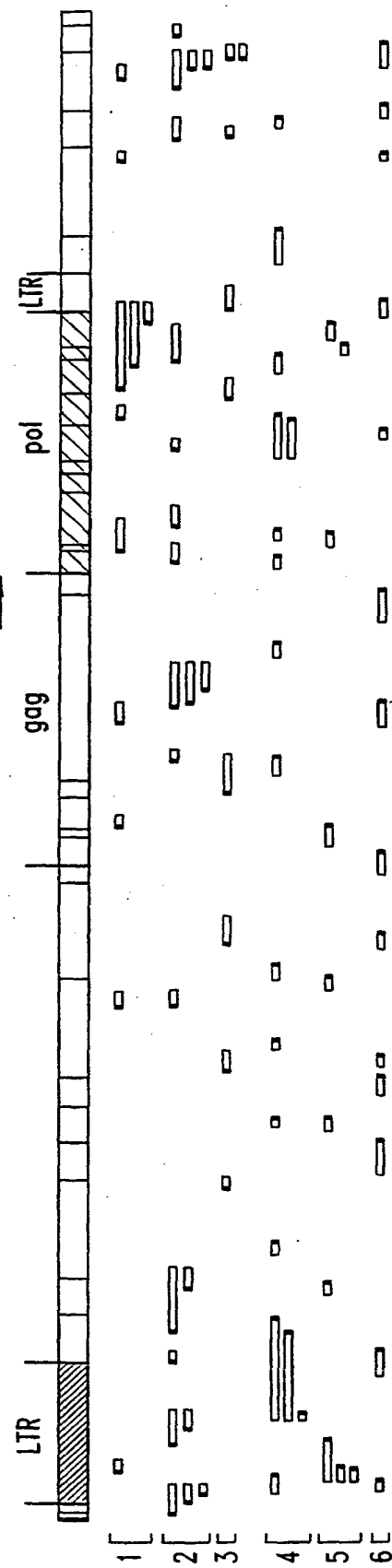


Fig. 5B

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NUCLEOTIDE SEQUENCE OF THE REPRESENTATIVE
BREAST-TUMOR SPECIFIC cDNA B18Ag1

TTA	GAG	ACC	CAA	TTG	GGA	CCT	AAT	TGG	GAC	CCA	AAT	TTC	TCA	AGT	GGA	48
Leu	Glu	Thr	Gln	Leu	Gly	Pro	Asn	Trp	Asp	Pro	Asn	Phe	Ser	Ser	Gly	
1				5					10					15		
GGG	AGA	ACT	TTT	GAC	GAT	TTC	CAC	CGG	TAT	CTC	CTC	GTG	GGT	ATT	CAG	96
Gly	Arg	Thr	Phe	Asp	Asp	Phe	His	Arg	Tyr	Leu	Leu	Val	Gly	Ile	Gln	
			20					25					30			
GGA	GCT	GCC	CAG	AAA	CCT	ATA	AAC	TTG	TCT	AAG	GCG	ATT	GAA	GTC	GTC	144
Gly	Ala	Ala	Gln	Lys	Pro	Ile	Asn	Leu	Ser	Lys	Ala	Ile	Glu	Val	Val	
		35					40					45				
CAG	GGG	CAT	GAT	GAG	TCA	CCA	GGA	GTG	TTT	TTA	GAG	CAC	CTC	CAG	GAG	192
Gln	Gly	His	Asp	Glu	Ser	Pro	Gly	Val	Phe	Leu	Glu	His	Leu	Gln	Glu	
	50					55					60					
GCT	TAT	CGG	ATT	TAC	ACC	CCT	TTT	GAC	CTG	GCA	GCC	CCC	GAA	AAT	AGC	240
Ala	Tyr	Arg	Ile	Tyr	Thr	Pro	Phe	Asp	Leu	Ala	Ala	Pro	Glu	Asn	Ser	
65					70					75					80	
CAT	GCT	CTT	AAT	TTG	GCA	TTT	GTG	GCT	CAG	GCA	GCC	CCA	GAT	AGT	AAA	288
His	Ala	Leu	Asn	Leu	Ala	Phe	Val	Ala	Gln	Ala	Ala	Pro	Asp	Ser	Lys	
			85						90					95		
AGG	AAA	CTC	CAA	AAA	CTA	GAG	GGA	TTT	TGC	TGG	AAT	GAA	TAC	CAG	TCA	336
Arg	Lys	Leu	Gln	Lys	Leu	Glu	Gly	Phe	Cys	Trp	Asn	Glu	Tyr	Gln	Ser	
			100				105						110			
GCT	TTT	AGA	GAT	AGC	CTA	AAA	GGT	TTT								363
Ala	Phe	Arg	Asp	Ser	Leu	Lys	Gly	Phe								
		115					120									

Fig. 6

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NUCLEOTIDE SEQUENCE OF THE REPRESENTATIVE
BREAST-TUMOR SPECIFIC cDNA B17Ag1

GC TGGGCACAGT GGCTCATACC TGTAATCCTG ACCGTTTCAG AGGCTCAGGT	60
CG CTTGAGCCCA AGATTTC AAG ACTAGTCTGG GTAACATAGT GAGACCCTAT	120
AA AAATAAAAAA ATGAGCCTGG TGTAGTGGCA CACACCAGCT GAGGAGGGAG	180
CT AGGAGA	196

Fig. 7

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NUCLEOTIDE SEQUENCE OF THE REPRESENTATIVE
BREAST-TUMOR SPECIFIC cDNA B17Ag2

GC TTGGGGGCTC TGACTAGAAA TTCAAGGAAC CTGGGATTCA AGTCCAAC TG	60
AC TTACACTGTG GNCTCCAATA AACTGCTTCT TTCCTATTCC CTCTCTATTA	120
AA GGAAAACGAT GTCTGTGTAT AGCCAAGTCA GNTATCCTAA AAGGAGATAC	180
AT TAAATATCAG AATGTAAAAC CTGGGAACCA GGTTC CCAGC CTGGGATTAA	240
CA AGAAGACTGA ACAGTACTAC TGTGAAAAGC CCGAAGNGGC AATATGTTCA	300
TT GAAGGATGGC TGGGAGAATG AATGCTCTGT CCCCAGTCC CAAGCTCACT	360
CT CCTTTATAGC CTAGGAGA	388

Fig. 8

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NUCLEOTIDE SEQUENCE OF THE REPRESENTATIVE
BREAST-TUMOR SPECIFIC cDNA B13Ag2a

GC CTATAATCAT GTTTCTCATT ATTTTCACAT TTTATTAACC AATTTCTGTT	60
AA AATATGAGGG AAATATATGA AACAGGGAGG CAATGTTTCTAG ATAATTGATC	120
TG ATTTCTACAT CAGATGCTCT TTCCTTTCTT GTTTATTTCC TTTTATTTT	180
GG TCGAATGTAA TAGCTTTGTT TCAAGAGAGA GTTTTGGCAG TTTCTGTAGC	240
CT GCTCATGTCT CCAGGCATCT ATTTGCACTT TAGGAGGTGT CGTGGGAGAC	300
CT ATTTTTTCCA TATTTGGGCA ACTACTA	337

Fig. 9

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NUCLEOTIDE SEQUENCE OF THE REPRESENTATIVE
BREAST-TUMOR SPECIFIC cDNA B13Ag1b

GC CATACAGTGC CTTTCCATTT ATTTAACCCC CACCTGAACG GCATAAACTG	60
GC TGGTGTTTTT TACTGTAAAC AATAAGGAGA CTTTGCTCTT CATTTAACC	120
AT TTCATATTTT ACGCTCGAGG GTTTTTACCG GTTCCTTTTT ACACTCCTTA	180
TT TAAGTCGTTT GGAACAAGAT ATTTTTTCTT TCCTGGCAGC TTTTAACATT	240
TT TGTGTCTGGG GGACTGCTGG TCACTGTTTC TCACAGTTGC AAATCAAGGC	300
CC AAGAAAAAAA AATTTTTTTG TTTTATTTGA AACTGGACCG GATAAACGGT	360
CG GCTGCTGTAT ATAGTTTTAA ATGGTTTATT GCACCTCCTT AAGTTGCACT	420
GG GGGGNTTTTG NATAGAAAGT NTTTANTCAC ANAGTCACAG GGACTTTTNT	480
NA CTGAGCTAAA AAGGGCTGNT TTTCGGGTGG GGGCAGATGA AGGCTCACAG	540
TC TCTTAGAGGG GGGAACNCT A	571

Fig. 10

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NUCLEOTIDE SEQUENCE OF THE REPRESENTATIVE
BREAST-TUMOR SPECIFIC cDNA B13Ag1a

TA ATAACCTAAA TATATTTTGA TCACCCACTG GGGTGATAAG ACAATAGATA	60
TT TCCAAAAAGC ATAAAACCAA AGTATCATAC CAAACCAAAT TCATACTGCT	120
CC GCACTGAAAC TTCACCTTCT AACTGTCTAC CTAACCAAAT TCTACCCTTC	180
GG TCGGTGCTCA CTACTCTTTT TTTTTTTTTT TTTNTTTTGG AGATGGAGTC	240
CA GCCCAGGGGT GGAGTACAAT GGCACAACCT CAGCTCACTG NAACCTCCGC	300
TT CATGAGATTC TCCTGNTTCA GCCTTCCCAG TAGCTGGGAC TACAGGTGTG	360
TG CCTGGNTAAT CTTTTTTNGT TTTNGGGTAG AGATGGGGGT TTTACATGTT	420
TG GTNTCGAACT CCTGACCTCA AGTGATCCAC CCACCTCAGG CTCCCAAAGT	480
TA CAGACATGAG CCACTGNGCC CAGNCCTGGT GCATGCTCAC TTCTCTAGGC	540
	548

Fig. 11

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NUCLEOTIDE SEQUENCE OF THE REPRESENTATIVE
BREAST-TUMOR SPECIFIC cDNA B11Ag1

TG CACATGCAGA ATATTCTATC GGTACTTCAG CTATTACTCA TTTTGATGGC	60
AG CCTATCCTCA AGATGAGTAT TTAGAAAGAA TTGATTTAGC GATAGACCAA	120
GC ACTCTGACTA CACGAAATTG TTCAGATGTG ATGGATTTAT GACAGTTGAT	180
GA GATTATTAAG TGATTATTTT AAAGGGAATC CATTAATTCC AGAATATCTT	240
TC AAGATGATAT AGAAATAGAA CAGAAAGAGA CTACAAATGA AGATGTATCA	300
TA TTGAAGAGCC TATAGTAGAA AATGAATTAG CTGCATTTAT TAGCCTTACA	360
TT TTCCTGATGA ATCTTATATT CAGCCATCGA CATAGCATTG CCTGATGGGC	420
GA ATAATAGAAA CTGGGTGCGG GGCTATTGAT GAATTCATCC NCAGTAAATT	480
AC AAAATATAAC TCGATTGCAT TTGGATGATG GAATACTAAA TCTGGCAAAA	540
GG AGCTACTAGT AACCTCTCTT TTTGAGATGC AAAATTTTCT TTTAGGGTTT	600
CT ACTTTACGGA TATTGGAGCA TAACGGGA	638

Fig. 12

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NUCLEOTIDE SEQUENCE OF THE REPRESENTATIVE
BREAST-TUMOR SPECIFIC cDNA B3CA3c

```
ACTGATGGAT GTCGCCGGAG GCGAGGGGCC TTATCTGATG CTCGGCTGCC TGTTCTGAT   60
GTGCGCGGCG ATTGGGCTGT TTATCTCAA CACCGCCACG GCGGTGCTGA TGGCGCCTAT  120
TGCCTTAGCG GCGGCGAAGT CAATGGGCGT CTCACCTAT CCTTTGCCA TGGTGGTGGC  180
GATGGCGGCT TCGGCGGCGT TTATGACCCC GGTCTCCTCG CCGGTTAACA CCCTGGTGCT  240
TGGCCCTGGC AAGTACTCAT TTAGCGATTT TGTCAAATA GGCCTG                        286
```

Fig. 13

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NUCLEOTIDE SEQUENCE OF THE REPRESENTATIVE
BREAST-TUMOR SPECIFIC cDNA B9CG1

AG CAGCCCCTTC TTCTCAATTT CATCTGTCAC TACCCTGGTG TAGTATCTCA 60
CA TTTTATAGC CTCCTCCCTG GTCTGTCTTT TGATTTTCCT GCCTGTAATC 120
AC ATAAGTGCAA GTAAACATTT CTAAAGTGTG GTTATGCTCA TGTCACCTCT 180
AA ATAGTTTCCA TTACCGTCTT AATAAAATTC GGATTTGTTC TTTNCTATTN 240
CA CCTATGACCG AA 262

Fig. 14

15/25

NUCLEOTIDE SEQUENCE OF THE REPRESENTATIVE
BREAST-TUMOR SPECIFIC cDNA B9CG3

AG CAAAGCCAGT GGTTCGAGCT CTCTACTGTG TAAACTCCTA AACCAAGGCC	60
TA AATGGTGGCA GGATTTTAT TATAACATG TACCCATGCA AATTCCTAT	120
GA TATATTCTTC TACATTTAAA CAATAAAAAT AATCTATTTT TAAAGCCTA	180
AG TTAGGTAAGA GTGTTTAATG AGAGGGTATA AGGTATAAAT CACCAGTCAA	240
TG CCTATGACCG A	261

Fig. 15

16/25

NUCLEOTIDE SEQUENCE OF THE REPRESENTATIVE
BREAST-TUMOR SPECIFIC cDNA B2CA2

GG GCATGGACGC AGACGCCTGA CGTTTGGCTG AAAATCTTTC ATTGATTCTG	60
AT AGGAAAATTC CCAAAGAGGG AATGTCCTGT TGCTCGCCAG TTTTNTGT	120
GG ANAAGGCAAN GAGCTCTTCA GACTATTGGN ATTNTCGTTC GGTCTTCTGC	180
CG NCTTGCNANG ATCTTCAT	208

Fig. 16

17/25

NUCLEOTIDE SEQUENCE OF THE REPRESENTATIVE
BREAST-TUMOR SPECIFIC cDNA B3CA1

GG GCATGGACGC AGACGCCTGA CGTTTGGCTG AAAATCTTTC ATTGATTCTG	60
AT AGGAAAATTC CCAAAGAGGG AATGTCCTGT TGCTCGCCAG TTTTNTGT	120
GG ANAAGGCAAN GAGCTCTTCA GACTATTGGN ATTNTCGTTC GGTCTTCTGC	180
CG NCTTGCAANG ATCTTCAT	208

Fig. 17

18/25

NUCLEOTIDE SEQUENCE OF THE REPRESENTATIVE
BREAST-TUMOR SPECIFIC cDNA B3CA2

GG GCATGGACGC AGACGCCTGA CGTTTGGCTG AAAATCTTTC ATTGATTCGT	60
AT AGGAAAATTC CCAAAGAGGG AATGTCCTGT TGCTCGCCAG TTTTNTGTT	120
GG ANAAGGCAAN GAGCTCTTCA GACTATTGGN ATTNTCGTTC GGTCTTCTGC	180
CG NCTTGCNANG ATCTTCAT	208

Fig. 18

19/25

NUCLEOTIDE SEQUENCE OF THE REPRESENTATIVE
BREAST-TUMOR SPECIFIC cDNA B3CA3

AG GGAGCAAGGA GAAGGCATGG AGAGGCTCAN GCTGGTCCTG GCCTACGACT	60
CT GTCGCCGGGG ATGGTGGAGA ACTGAAGCGG GACCTCCTCG AGGTCCTCCG	120
TC NCCGTCCAGG AGGAGGGTCT TTCCGTGGTC TNGGAGGAGC GGGGGGAGAA	180
TC ATGGTCNACA TCCC	204

Fig. 19

20/25

NUCLEOTIDE SEQUENCE OF THE REPRESENTATIVE
BREAST-TUMOR SPECIFIC cDNA B4CA1

TC AGGAGCGGGT AGAGTGGCAC CATTGAGGGG ATATTCAAAA ATATTATTTT	60
TG ATAGTTGCTG AGTTTTTCTT TGACCCATGA GTTATATTGG AGTTTATTTT	120
CC AATCGCATGG ACATGTTAGA CTTATTTTCT GTTAATGATT NCTATTTTTA	180
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GC TTAGTATGTG ACCA	264

Fig. 20

21/25

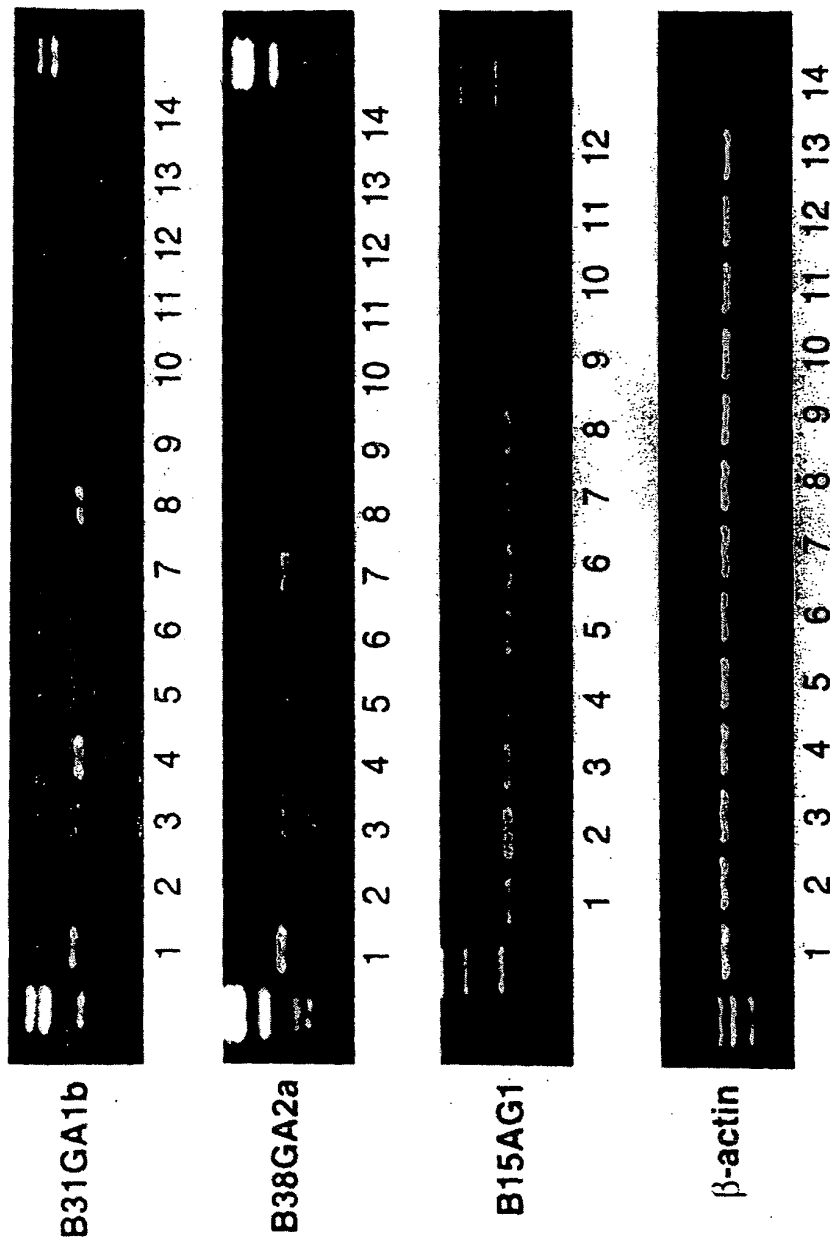
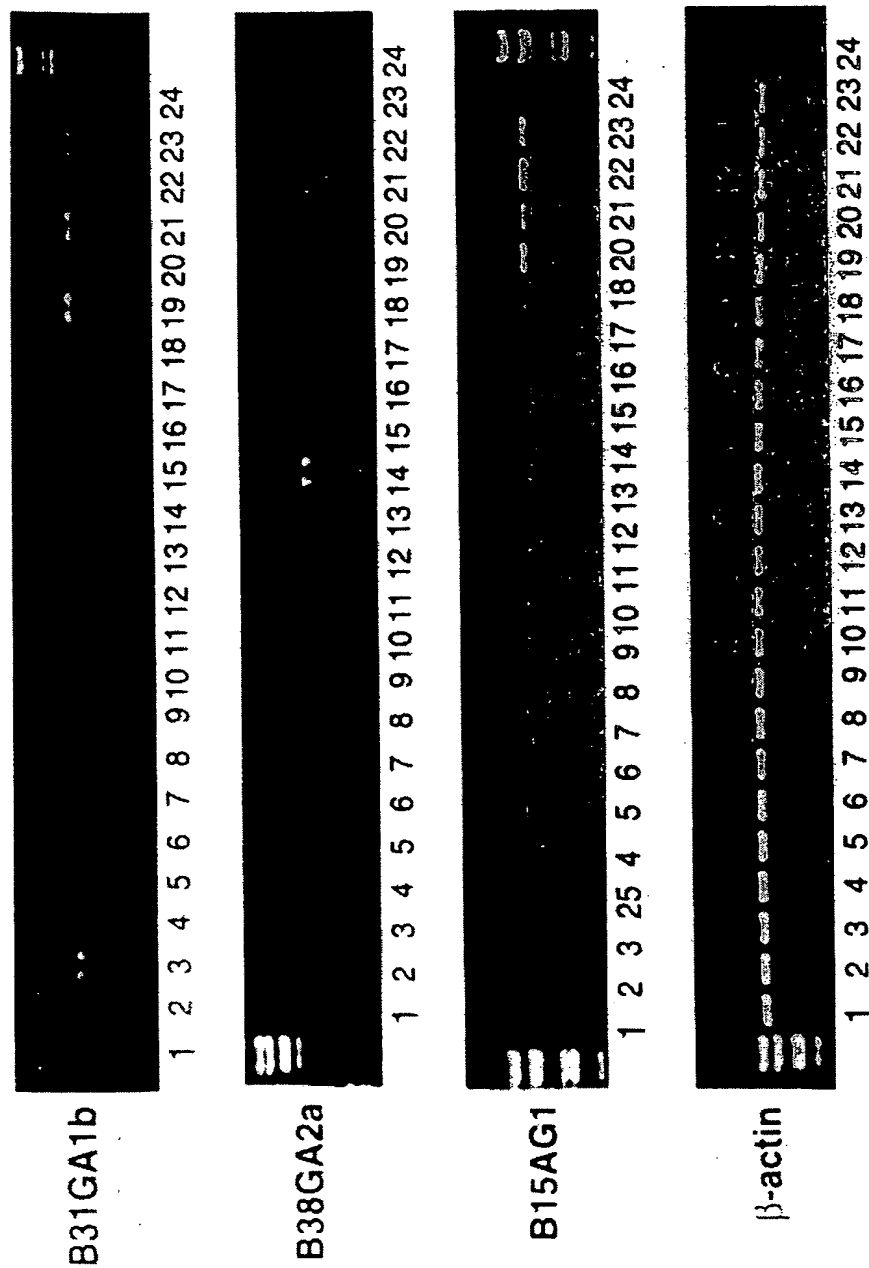
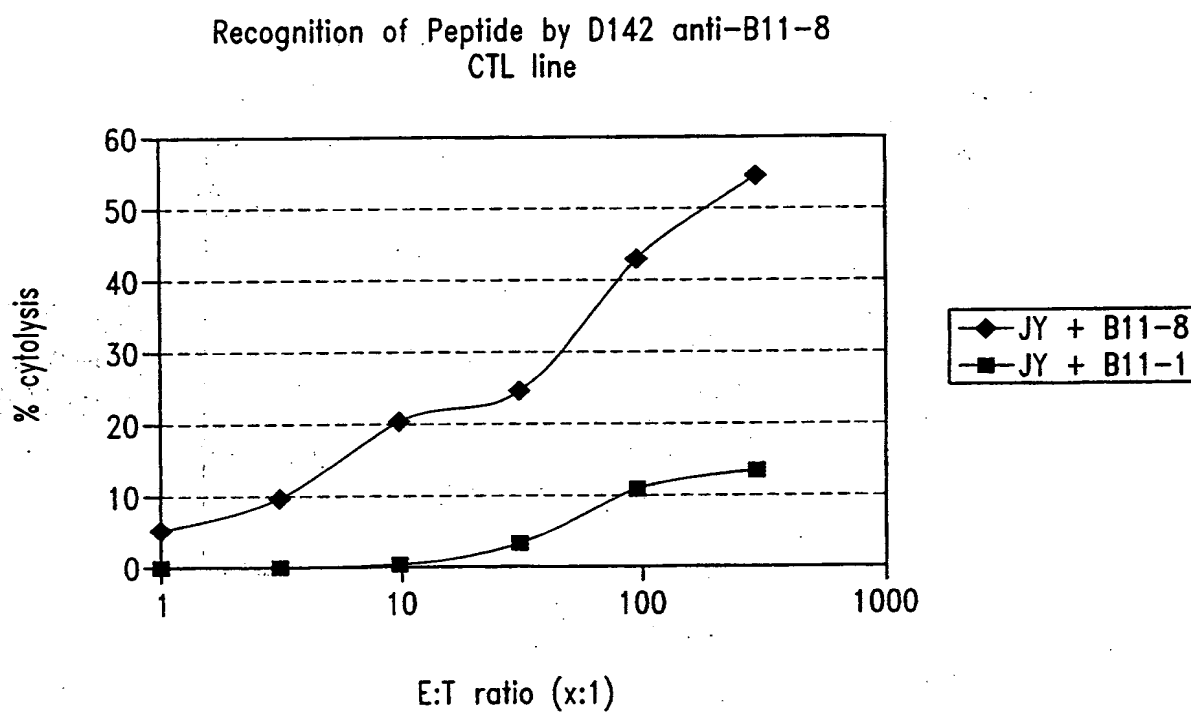


Fig. 21A

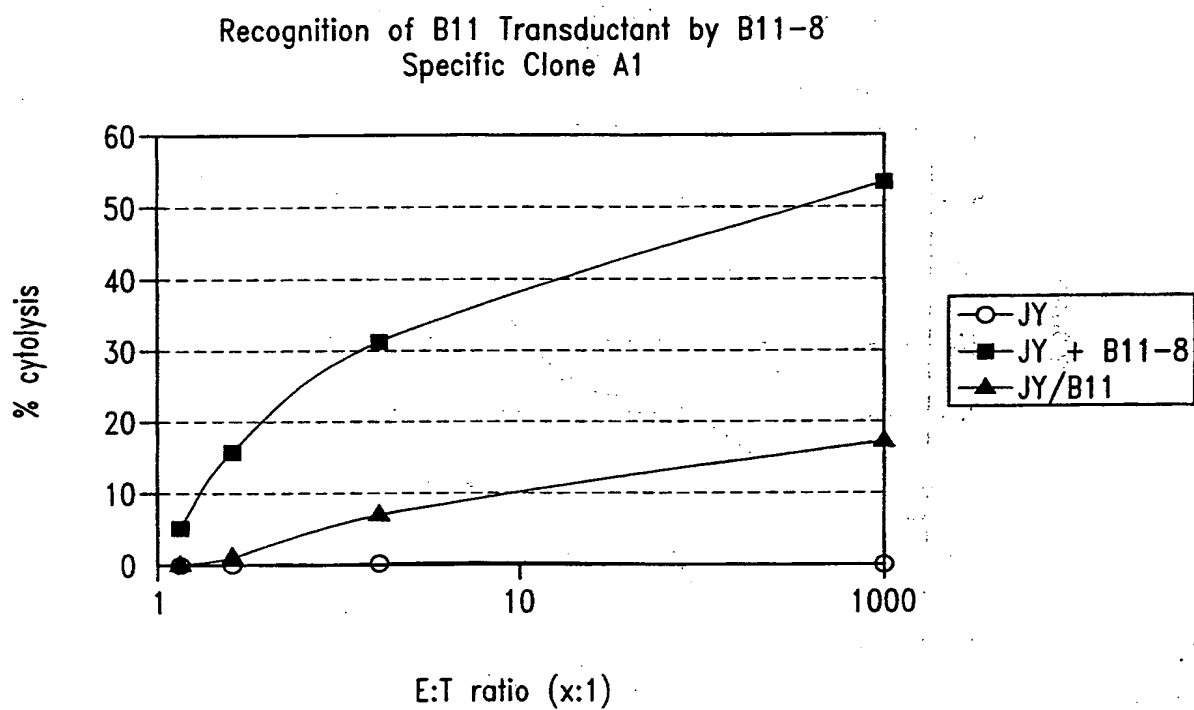
22/25

*Fig. 21B*

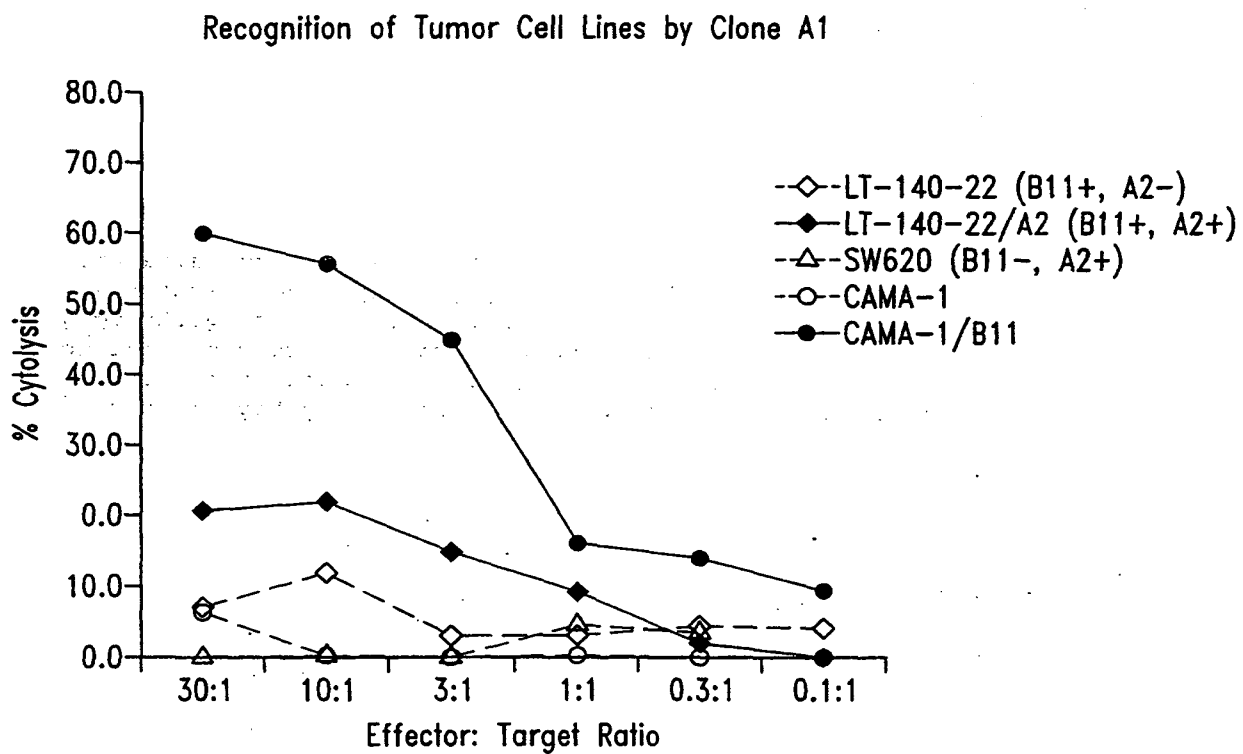
23/25

*Fig. 22*

24/25

*Fig. 23*

25/25

*Fig. 24*

SUBSTITUTE SHEET (RULE 26)

SEQUENCE LISTING

<110> Corixa Corporation

<120> COMPOSITIONS AND METHODS FOR THE
TREATMENT AND DIAGNOSIS OF BREAST CANCER

<130> 210121.41926PC

<140> PCT

<141> 2000-04-07

<160> 317

<170> FastSEQ for Windows Version 3.0

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<213> Homo sapien

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<211> 121

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Gly Ala Ala Gln Lys Pro Ile Asn Leu Ser Lys Ala Ile Glu Val Val	
35 40 45	
Gln Gly His Asp Glu Ser Pro Gly Val Phe Leu Glu His Leu Gln Glu	
50 55 60	
Ala Tyr Arg Ile Tyr Thr Pro Phe Asp Leu Ala Ala Pro Glu Asn Ser	
65 70 75 80	
His Ala Leu Asn Leu Ala Phe Val Ala Gln Ala Ala Pro Asp Ser Lys	
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<212> DNA

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tgacaccaac	ttacactgtg	gnetccaata	aactgcttct	ttctattcc	ctctctatta	180
aataaaataa	ggaaaacgat	gtctgtgtat	agccaagtca	gntatcctaa	aaggagatac	240
taagtacat	taaatatcag	aatgtaaaac	ctgggaacca	ggttcccagc	ctgggattaa	300
actgacagca	agaagactga	acagtactac	tgtgaaaagc	ccgaagnngc	aatatgttca	360
ctctaccgtt	gaaggatggc	tgggagaatg	aatgctctgt	ccccagtc	caagctcact	388
tactatacct	cctttatagc	ctaggaga				

<210> 13
 <211> 337
 <212> DNA
 <213> Homo sapien

<400> 13						60
tagtagttgc	ctataatcat	gtttctcatt	attttcacat	tttattaacc	aatttctgtt	120
tacctgaaa	aatatgaggg	aaatatatga	aacagggagg	caatgttcag	ataattgatc	180
acaagatatg	atttctacat	cagatgctct	ttcctttcct	gtttatttcc	tttttatttc	240
ggttggtggg	tcgaatgtaa	tagctttgtt	tcaagagaga	gttttggcag	tttctgtagc	300
ttctgacact	gctcatgtct	ccaggcatct	atttgcactt	taggaggtgt	cgtgggagac	337
tgagaggtct	attttttcca	tatttgggca	actacta			

<210> 14
 <211> 571
 <212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(571)

<223> n = A,T,C or G

<400> 14

tagtagttgc	catacagtgc	ctttccattt	atttaacccc	cacctgaacg	gcataaaactg	60
agtgttcagc	tggtgttttt	tactgtaaac	aataaggaga	ctttgctctt	catttaaacc	120
aaaatcatat	ttcatatttt	acgctcgagg	gtttttaccg	gttccttttt	acactcctta	180
aaacagtttt	taagtcgttt	ggaacaagat	attttttctt	tcctggcagc	ttttaacatt	240
atagcaaatt	tgtgtctggg	ggactgctgg	tcactgtttc	tcacagttgc	aaatcaaggc	300
atttgcaacc	aagaaaaaaa	aatttttttg	ttttatttga	aactggaccg	gataaacggt	360
gtttggagcg	gctgctgtat	atagttttta	atgggtttatt	gcacctcctt	aagttgcact	420
tatgtggggg	ggggnntttt	natagaaagt	ntttantcac	anagtcacag	ggacttttnt	480
cttttggnna	ctgagctaaa	aagggctgnt	tttcgggtgg	gggcagatga	aggctcacag	540
gaggcctttc	tcttagaggg	gggaactnct	a			571

<210> 15

<211> 548

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(548)

<223> n = A,T,C or G

<400> 15

tatatattta	ataacttaaa	tatatatttga	tcacccactg	gggtgataag	acaatagata	60
taaaagtatt	tcaaaaaagc	ataaaaccaa	agtatcatat	caaaccaaat	tcatactgct	120
tccccacccc	gcactgaaac	ttcaccttct	aactgtctac	ctaaccaaat	tctacccttc	180
aagtcttttg	tgcgtgctca	ctactctttt	tttttttttt	tttnttttgg	agatggagtc	240
tggtgtgtga	gcccaggggt	ggagtacaat	ggcacaacct	cagctcactg	naacctccgc	300
ctcccaggtt	catgagattc	tcctgnttca	gccttcccag	tagctgggac	tacaggtgtg	360
catcaccatg	cctggntaat	cttttttngt	tttngggtag	agatgggggt	tttacatgtt	420
ggccaggntg	gtntcgaact	cctgacctca	agtgatccac	ccacctcagg	ctcccaaagt	480
gctaggatta	cagacatgag	ccactgngcc	cagnctgggt	gcatgctcac	ttctctaggc	540
aactacta						548

<210> 16

<211> 638

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(638)

<223> n = A,T,C or G

<400> 16

ttccgttatg	cacatgcaga	atattctatc	ggtacttcag	ctattactca	ttttgatggc	60
gcaatccgag	cctatcctca	agatgagtat	ttagaaagaa	ttgatttagc	gatagaccaa	120
gctggtaagc	actctgacta	cacgaaattg	ttcagatgtg	atggatttat	gacagttgat	180

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ctttggaaga gattattaag tgattatattt aaaggggaatc cattaattcc agaatatctt 240
ggtttagctc aagatgatat agaaatagaa cagaaagaga ctacaaatga agatgtatca 300
ccaactgata ttgaagagcc tatagtagaa aatgaattag ctgcatttat tagccttaca 360
catagegatt ttcctgatga atcttatatt cagccatcga catagcatta cctgatgggc 420
aaccttacga ataatagaaa ctgggtgcgg ggctattgat gaattcatcc ncagtaaatt 480
tggatatnac aaaatataac tcgattgcat ttggatgatg gaatactaaa tctggcaaaa 540
gtaactttgg agctactagt aacctctctt tttgagatgc aaaattttct tttagggttt 600
cttattctct actttacgga tattggagca taacggga 638

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<210> 17
<211> 286
<212> DNA
<213> Homo sapien

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<400> 17
actgatggat gtcgccggag gcgaggggcc ttatctgatg ctcggtgcc tgttcgtgat 60
gtgcgcggcg attgggctgt ttatctcaaa caccgccacg gcggtgctga tggcgccat 120
tgccttagcg gcggcgaagt caatgggcgt ctcacctat ccttttgcca tgggtggggc 180
gatggcggct tcggcggcgt ttatgacccc ggtctcctcg ccggttaaca cctgggtgct 240
tggccctggc aagtactcat ttagcgattt tgtcaaaata ggcgtg 286

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<210> 18
<211> 262
<212> DNA
<213> Homo sapien
<220>
<221> misc_feature
<222> (1)...(262)
<223> n = A,T,C or G

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<400> 18
tcggtcatag cagccccttc ttctcaattt catctgtcac taccctgggtg tagtatctca 60
tagccttaca tttttatagc ctctccctg gtctgtcttt tgattttcct gcctgtaatc 120
catatcacac ataactgcaa gtaaacattt ctaaagtgtg gttatgctca tgtcactcct 180
gtgncaagaa atagtttcca ttaccgtctt aataaaattc ggatttgctt ttttctattn 240
tcactcttca cctatgaccg aa 262

```

```

<210> 19
<211> 261
<212> DNA
<213> Homo sapien

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<400> 19
tcggtcatag caaagccagt ggtttgagct ctctactgtg taaactccta aaccaaggcc 60
atztatgata aatgggtggca ggatttttat tataaacatg tacccatgca aatttcctat 120
aactctgaga tatattcttc tacatttaaa caataaaaaat aatctatttt taaaagccta 180
atttgcgtag ttaggtaaga gtgtttaatg agaggggtata aggtataaat caccagtcaa 240
cgtttctctg cctatgaccg a 261

```

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<210> 20
<211> 294
<212> DNA
<213> Homo sapien

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<220>

<221> misc_feature

<222> (1)...(294)

<223> n = A,T,C or G

<400> 20

tacaacgagg	cgacgtcggg	aaaatcggac	atgaagccac	cgctgggtctt	ttcgtccgag	60
cgataggcgc	cggccagcca	gcggaacggg	tgcccggatg	gcgaagcgag	cgggagttct	120
tcggactgag	tatgaatctt	gttgtgaaaa	tactcgccgc	cttcgttcga	cgacgtcgcg	180
tcgaaatctt	cgantcctt	acgatcgaa	tcttcgtggg	cgacgatcgc	ggtcagttcc	240
gccccaccga	aatcatgggt	gagccggatg	ctgnccccga	agncctcggt	tgtg	294

<210> 21

<211> 208

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(208)

<223> n = A,T,C or G

<400> 21

ttggtaaagg	gcatggacgc	agacgcctga	cgtttggtctg	aaaatctttc	attgattcgt	60
atcaatgaat	aggaaaattc	ccaaagaggg	aatgtcctgt	tgctcgccag	ttttntgtt	120
gttctcatgg	anaaggcaan	gagctcttca	gactattggn	attntcggtc	ggctctctgc	180
caactagtcg	ncttgcng	atcttcat				208

<210> 22

<211> 287

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(287)

<223> n = A,T,C or G

<400> 22

ncnttgagc	tgagtgattg	agatntgtaa	tggttgtaag	ggtgattcag	gcggattagg	60
gtggcgggtc	acccggcagt	gggtctcccg	acaggccagc	aggatttggg	gcaggtagcg	120
ngtgcgcatc	gctcgactat	atgctatggc	aggcgagccg	tggaaggngg	atcaggtcac	180
ggcgctggag	ctttccacgg	tccatgnatt	gngatggctg	ttctaggcgg	ctgttgccaa	240
gcgtgatggg	acgttggtg	gagcattgat	ttctgggtgc	aaggtgg		287

<210> 23

<211> 204

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(204)

<223> n = A,T,C or G

<400> 23

ttgggtaaaag ggagcaagga gaaggcatgg agaggctcan gctggtcctg gcctacgact	60
gggccaaagct gtcgccgggg atggtggaga actgaagcgg gacctcctcg aggtcctccg	120
ncgttacttc nccgtccagg aggaggggtct ttccgtggtc tnggaggagc ggggggagaa	180
gatnctcctc atggtcnaca tccc	204

<210> 24

<211> 264

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (264)

<223> n = A,T,C or G

<400> 24

tggattgggc aggagcgggt agagtggcac cattgagggg atattcaaaa atattatttt	60
gtcctaaatg atagtgtgtg agtttttctt tgacccatga gttatattgg agtttatttt	120
ttaactttcc aatcgcatgg acatgttaga cttattttct gttaatgatt nctattttta	180
ttaaattgga tttgagaaat tggttnttat tatatcaatt tttggtattt gttgagtttg	240
acattatagc ttagtatgtg acca	264

<210> 25

<211> 376

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (376)

<223> n = A,T,C or G

<400> 25

ttacaacgag gggaaactcc gtctctacaa aaattaaaaa attagccagg tgtgggtggtg	60
tgcacccgca atcccagcta cttggggaggt tgagacacaa gantcaccta natgtgggag	120
gtcaaggttg catgagtcac gattgtgcca ctgcactcca gcctgggtga cagaccgaga	180
ccctgcctca anaganaang aataggaagt tcagaaatcn tggntgtggn gccagcaat	240
ctgcactctat ncaacccctg caggcaangc tgatgcagcc tangttcaag agctgctgtt	300
tctggaggca gcagttnggg cttccatcca gtatcacggc cacactcgca cnagccatct	360
gtcctccgtn tgtnac	376

<210> 26

<211> 372

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (372)

<223> n = A,T,C or G

<400> 26

ttacaacgag gggaaactcc gtctctacaa aaattaaaaa attagccagg tgtgggtggtg	60
tgcacctgta atcccagcta cttggggcggc tgagacacaa gaaccaccta aatgtgggag	120

ggtcaagggtt	gcatgagtc	tgatcgcgcc	actgcactcc	agcctgggtg	acagactgag	180
accctgcctc	aaaagaaaaa	gaataggaag	ttcagaaacc	ctgggtgtgg	ngcccagcaa	240
tctgcattta	aacaatccct	gcaggcaatg	ctgatgcagc	ctaagttcaa	gagctgctgt	300
tctggaggca	gnagtaagg	cttccatcca	gcatacggg	caacactgca	aaagcacctg	360
tcctcggttg	ta					372

<210> 27
 <211> 477
 <212> DNA
 <213> Homo sapien

<400> 27						
ttctgtccac	atctacaagt	tttattttatt	ttgtgggttt	tcagggtgac	taagtttttc	60
cctacattga	aaagagaagt	tgctaaaagg	tgacacaggaa	atcatttttt	taagtgaata	120
tgataatatg	gggtccgtgct	taatacaact	gagacatatt	tgttctctgt	tttttttagag	180
tcacctctta	aagtccaatc	ccacaatggg	gaaaaaaaaa	tagaaagtat	ttgttctacc	240
tttaaggaga	ctgcagggat	tctccttgaa	aacggagtat	ggaatcaatc	ttaaataaat	300
atgaaattgg	ttggtcttct	gggataagaa	attcccaact	cagtgtgctg	aaatteacct	360
gacttttttt	gggaaaaaat	agtcgaaaaat	gtcaatttgg	tccataaaat	acatgttact	420
attaaaagat	atttaaagac	aaattctttc	agagctctaa	gattggtgtg	gacagaa	477

<210> 28
 <211> 438
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(438)
 <223> n = A,T,C or G

<400> 28						
tctncaacct	cttgantgtc	aaaaaccttn	taggetatct	ctaaaagctg	actgggtattc	60
attccagcaa	aatccctcta	gtttttggag	tttcctttta	ctatctgggg	ctgcctgagc	120
cacaaatgcc	aaattaagag	catggctatt	ttcgggggct	gacagggtcaa	aaggggtgta	180
aatccgataa	gcctcctgga	ggtgctctaa	aaacactcct	ggtgactcat	catgcccctg	240
gacgacttca	atcgncttag	acaagtttat	aggtttctgg	gcagctccct	gaatacccac	300
gaggagatac	cggtggaaat	cgtcaaaagt	tctccctcca	cttgagaaat	ttgggtccca	360
attaggtccc	aattgggtct	ctaataccta	ttcctctagc	ttcctcctcc	ggncatttgg	420
ttgatgtgag	gttgaaga					438

<210> 29
 <211> 620
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(620)
 <223> n = A,T,C or G

<400> 29						
aagagggtac	cagccccaag	ccttgacaac	ttccataggg	tgtcaagcct	gtgggtgcac	60
agaagtcaaa	aattgagttt	tgggatcctc	agcctagatt	tcagaggata	taaagaaaca	120
cctaacacct	agatattcag	acaaaagttt	actacaggga	tgaagctttc	acggaaaacc	180

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tctactagga aagtacagaa gagaaatgtg ggtttggagc ccccaaacag aatccccctct 240
agaacactgc ctaatgaaac tgtgagaaga tggccactgt catccagaca ccagaatgat 300
agacccacca aaaactttatg ccatattgcc tataaaacct acagacactc aatgccagcc 360
ccatgaaaaa aaaactgaga agaagactgt nccctacaat gccaccggag cagaactgcc 420
ccaggccatg gaagcacagc tcttatatca atgtgacctg gatgttgaga catggaatcc 480
nangaaatcn ttttaanact tccacggttn aatgactgcc ctattanatt cngaacttan 540
atccnggcct gtgacctctt tgctttggcc attccccctt tttggaatgg ctnttttttt 600
cccatgcctg tncctcttta

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<210> 30

<211> 100

<212> DNA

<213> Homo sapien

<400> 30

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ttacaacgag ggggtcaatg tcataaatgt cacaataaaa caatctcttc tttttttttt 60
tttttttttt tttttttttt tttttttttt tttttttttt 100

```

<210> 31

<211> 762

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (762)

<223> n = A,T,C or G

<400> 31

```

tagtctatgc gccggacaga gcagaattaa attggaagtt gccctccgga ctttctaccc 60
acactcttcc tgaaaagaga aagaaaagag gcaggaaaaga ggtaggatt tcattttcaa 120
gagtcagcta attaggagag cagagttag acagcagtag gcaccccatg atacaaacca 180
tggacaaaagt ccctgttag taactgccag acatgatcct gctcagggtt tgaaatctct 240
ctgcccataa aagatggaga gcaggagtgc catccacatc aacacgtgtc caagaaagag 300
tctcaggag acaaggggtat caaaaaacaa gattcttaat gggaaggaaa tcaaaccaaa 360
aaattagatt tttctctaca tatatataat atacagatat ttaacacatt attccagagg 420
tggctccagt ccttggggct tgagagatgg tgaaaacttt tgttccacat taacttctgc 480
tctcaaattc tgaagtatat cagaatggga caggcaatgt tttgctccac actggggcac 540
agacccaaat ggttctgtgc ccgaagaaga gaagcccga agacatgaag gatgcttaag 600
gggggttggg aaagccaaat tgggtantatc ttttctcct gcctgtgttc cngaagtctc 660
cnctgaagga attcttaaaa ccctttgtga ggaaatgcc ccttaccatg acaantggtc 720
ccattgcttt tagggngatg gaaacaccaa ggggtttgat cc 762

```

<210> 32

<211> 276

<212> DNA

<213> Homo sapien

<400> 32

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tagtctatgc gtgtattaac ctccccctcc tcagtaacaa ccaaagaggc aggagctgtt 60
attaccaacc ccattttaca gatgcacaa taatgacaga gaagtgaagt gacttgcgca 120
cacaaccagt aaattggcag agtcagattt gaatccatgg agtctggtct gcactttcaa 180
tcaccgaata ccctttctaa gaaacgtgtg ctgaatgagt gcatggataa atcagtgtct 240
actcaacatc tttgcctaga tatcccgcat agacta 276

```

<210> 33
<211> 477
<212> DNA
<213> Homo sapien

<400> 33
tagtagttgc caaatatttg aaaatttacc cagaagtgat tgaaaacttt ttggaaacaa 60
aaacaaataa agccaaaagg taaaataaaa atatctttgc actctcgta ttacctatcc 120
ataacttttt caccgtaagc tctctgctt gttagtgtag tgtgggtata ttaaactttt 180
tagttattat tttttattca cttttccact agaaagtcac tattgattta gcacacatgt 240
tgatctcatt tcattttttc tttttatagg caaaatttga tgctatgcaa caaaaatact 300
caagcccatt atcttttttc cccccgaaat ctgaaaattg caggggacag aggggaagtta 360
tcccattaaa aaattgtaaa tatgttcagt ttatgtttta aaatgcacaa aacataagaa 420
aattgtgttt acttgagctg ctgattgtaa gcagttttat ctcaggggca actacta 477

<210> 34
<211> 631
<212> DNA
<213> Homo sapien

<400> 34
tagtagttgc caattcagat gatcagaaat gctgctttcc tcagcattgt cttgttaaac 60
cgcatgccat ttggaacttt ggagtgaga agccaaaagg aagaggtgaa tgacatatat 120
atatatatat attcaatgaa agtaaaatgt atatgctcat atactttcta gttatcagaa 180
tgagttaagc tttatgccat tgggctgctg catattttta tcagaagata aaagaaaatc 240
tgggcatttt tagaatgtga tacatgtttt tttaaaactg ttaaataatta tttcgatatt 300
tgtctaagaa ccggaatgtt cttaaaattt actaaaacag tattgtttga ggaagagaaa 360
actgtactgt ttgccattat tacagtcgta caagtgcacg tcaagtcacc cactctctca 420
ggcatcgata tccacctcat agctttacac attttgacgg ggaatattgc agcatcctca 480
ggcctgacat ctggggaaagg ctcatgcca cctactgctc cttgctcgtt gatttgtttt 540
aaaatattgt gcctggtgtc acttttaagc cacagccctg cctaaaagcc agcagagaac 600
agaacccgca ccattctata ggcaactact a 631

<210> 35
<211> 578
<212> DNA
<213> Homo sapien

<400> 35
tagtagttgc catcccatat tacagaaggc tctgtataca tgacttattt ggaagtgate 60
tgttttctct ccaaaccat ttatcgtaat ttcaccagtc ttggatcaat cttggtttcc 120
actgatacca tgaaacctac ttggagcaga cattgcacag ttttctgtgg taaaaactaa 180
agggttattt gctaagctgt catcttatgc ttagtatttt ttttttacag tggggaattg 240
ctgagattac attttggtat tcattagata ctttgggata acttgacact gtcttctttt 300
tttcgctttt aattgctatc atcatgctt tgaaacaaga acacattagt cctcaagtat 360
tacataagct tgcttggtac gcctggtggt ttaaaggact atctttggcc tcagggtcac 420
aagaatgggc aaagtgtttc cttatgttct gtagttctca ataaaagatt gccaggggcc 480
gggtactgtg gctcgactg taatcccagc actttgggaa gctgaggctg gcggatcatg 540
ttagggcagg tgttcgaaac cagcctgggc aactacta 578

<210> 36
<211> 583
<212> DNA
<213> Homo sapien

<400> 36

tagtagttgc	ctgtaatccc	agcaactcag	gaggctgggg	caggagaatc	agttgaacct	60
gggaggcaga	agttgtaatt	agcaaagatc	gcaccattgc	acttcagcct	gggcaacaag	120
agtgagattc	catctcaaaa	acaaaaaaaa	gaaaaagaaa	agaaaaggaa	aaaacgtata	180
aaccacagcca	aaacaaaatg	atcattcttt	taataagcaa	gactaattta	atgtgtttat	240
ttaatcaaaag	cagttgaatc	ttctgagtta	ttggtgaaaa	tacccatgta	gttaatttag	300
ggttcttact	tgggtgaacg	tttgatgttc	acagggttata	aaatgggttaa	caaggaaaat	360
gatgcataaa	gaatcttata	aactactaaa	aataaataaa	atataaatgg	ataggtgcta	420
tggatggagt	ttttgtgtaa	tttaaaatct	tgaagtcatt	ttggatgctc	attgggtgtc	480
tggtaatctc	cattaggaaa	aggttatgat	atggggaaac	tgtttctgga	aattgcggaa	540
tgtttctcat	ctgtaaaatg	ctagtatctc	agggcaacta	cta		583

<210> 37

<211> 716

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(716)

<223> n = A,T,C or G

<400> 37

gatctactag	tcatntggat	tctatccatg	gcagctaagc	ctttctgaat	ggattctact	60
gctttcttgt	tctttaatcc	agacccttat	atatgtttat	gttcacaggc	agggcaatgt	120
ttagtgaaaa	caattctaaa	ttttttatct	tgcattttca	tgctaatttc	cgtcacactc	180
cagcaggctt	cctgggagaa	taaggagaaa	tacagctaaa	gacattgtcc	ctgcttactt	240
acagcctaata	ggtatgcaaa	accacttcaa	taaagtaaca	ggaaaagtac	taaccaggta	300
gaatggacca	aaactgatata	agaaaaatca	gaggaagaga	ggaacaaata	tttactgagt	360
cctagaatgt	acaaggcttt	ttaattacat	attttatgta	aggcctgcaa	aaaacagggtg	420
agtaatcaac	atttgtccca	ttttacatat	aaggaaactg	aagcttaaat	tgaataattt	480
aatgcataga	ttttatagtt	agaccatggt	caggctcccta	tggtatactt	actagctgta	540
tgaatatgag	aaaataattt	tggtattttc	ttggcatcag	tattttcatc	tgcaaaataa	600
agctaaagtt	atttagcaaa	cagtcagcat	agtgcctgat	acatagtagg	tgctccaaac	660
atgattacnc	tantattngg	tattanaaaa	atccaatata	ggcntggata	aaaccg	716

<210> 38

<211> 688

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(688)

<223> n = A,T,C or G

<400> 38

ttctgtccac	atatcatccc	actttaattg	ttaatcagca	aaactttcaa	tgaaaaatca	60
tccattttta	ccaggatcac	accaggaaac	tgaagggtga	ttttttttta	ccttaaaaaa	120
aaaaaaaaaa	accaaacaaa	ccaaaacaga	ttaacagcaa	agagttctaa	aaaattttaca	180
tttctcttac	aactgtcatt	cagagaacaa	tagttcttaa	gtctgttaaa	tcttggcatt	240
aacagagaaa	cttgatgaan	agttgtactt	ggaatattgt	ggattttttt	ttttgtctaa	300
tctcccccta	ttgttttgcc	aacagtaatt	taagtttgtg	tggaacatcc	ccgtagttga	360
agtgtaaaca	atgtatagga	aggaatatat	gataagatga	tgcatcacat	atgcattaca	420
tgtagggacc	ttcacaactt	catgcactca	gaaaacatgc	ttgaagagga	ggagaggacg	480

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gccaggggtc accatccagg tgccttgagg acagagaatg cagaagtggc actgttgaaa 540
tttagaagac catgtgtgaa tggtttcagg cctgggatgt ttgccaccaa gaagtgcctc 600
cgagaaattt ctttccatt tgggaatacag ggtggcttga tgggtacggg gggtgaccca 660
acgaagaaaa tgaaattctg ccctttcc 688

```

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<210> 39
<211> 585
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(585)
<223> n = A,T,C or G

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<400> 39
tagtagttgc cgcnnaccta aaanttggaa agcatgatgt ctaggaaaca tantaaaata 60
gggtatgcct atgtgtctaca gagagatgtt agcatttaaa gtgcatantt ttatgtattt 120
tgacaaatgc atatnctctc ataattccaca actgattacg aagctattac aattaaaaag 180
tttggccggg cgtggtgggc ggtggctgac gcctgtaatc ccagcacttt gggaggccga 240
ggcacgcgga tcacgaggtc gggagttcaa gaccatcctg gctaacacgg tgaaagtcca 300
tctctactaa aaatacgaaa aaattacccc ggctggtggg cgggcgctg tagtcccagc 360
tactccggag gctgaggcag gagaatggcg tgaacccagg acacggagct tgcagtgtgc 420
caacatcacg tcaactgcct ccagcctggg ggacaggaac aagantcccg tcctcanaaaa 480
agaaaaatac tactnatant ttcnacttta ttttaantta cacagaactn cctcttggtg 540
cccccttacc attcatctca cccacctcct atagggcacn nctaa 585

```

```

<210> 40
<211> 475
<212> DNA
<213> Homo sapien

```

```

<400> 40
tctgtccaca ccaatcttag aagctctgaa aagaatttgt ctttaaatat cttttaatag 60
taacatgtat tttatggacc aaattgacat tttcgactgt tttttccaaa aaagtcagggt 120
gaatttcagc acactgagtt gggaatttct tatcccagaa gaccaaccaa tttcataattt 180
atttaagatt gattccatac tccgttttca aggagaatcc ctgcagtctc tttaaaggta 240
gaacaaatac ttcctatttt tttttcacca ttgtgggatt ggactttaag aggtgactct 300
aaaaaaacag agaacaaata tgtctcagtt gtattaagca cggaccata ttatcatatt 360
cacttaaaaa aatgatttcc tgtgcacctt ttggcaactt ctcttttcaa tgtagggaaa 420
aacttagtca ccctgaaaac ccacaaaata aataaaactt gtagatgtgg acaga 475

```

```

<210> 41
<211> 423
<212> DNA
<213> Homo sapien

```

```

<400> 41
taagagggtg catcgggtaa gaacgtaggc acatctagag cttagagaag tctggggtag 60
gaaaaaaatc taagtattta taagggtata ggtaacattt aaaagtaggg ctagctgaca 120
ttatttagaa agaacacata cggagagata agggcaagg actaagacca gaggaacact 180
aatatttagt gatcacttcc attcttggtg aaaatagtaa cttttaagtt agcttcaagg 240
aagatttttg gccatgatta gttgtcaaaa gttagttctc ttgggtttat attactaatt 300
ttgttttaag attcttggtg gtgctttaat aaagtcaggt tatatcaaac gctctaaaac 360
attgtagcat gttaaagtgc acaatatact taccatttgt tgtatatggc tgtaccctct 420

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cta

423

<210> 42
 <211> 527
 <212> DNA
 <213> Homo sapien

 <220>
 <221> misc_feature
 <222> (1) ... (527)
 <223> n = A,T,C or G

<400> 42
 tctcctaggc taatgtgtgt gtttctgtaa aagtaaaaag ttaaaaattt taaaaataga 60
 aaaaagctta tagaataaga atatgaagaa agaaaatatt ttgtacatt tgcacaatga 120
 gtttatgttt taagctaagt gttattacaa aagagccaaa aaggttttta aaattaaaac 180
 gtttgtaaag ttacagtacc cttatgttaa ttataattg aagaaagaaa aacttttttt 240
 tataaatgta gtgtagccta agcatagct atttataaag tctggcagtg ttcaataatg 300
 tcctaggcct tcacattcac tcaactgact acccagagca acttcagtc ctgtaagctc 360
 cattcggtg aagtgcctta tacaggtgca ccattttatt tacagtattt ttactgtacc 420
 ttctctatgt ttccatagt ttcgatatac aaataccact ggttactatn gcccnacagg 480
 taattccagt aaacaggcct gtatacgtct ggtancccta gngaaga 527

<210> 43
 <211> 331
 <212> DNA
 <213> Homo sapien

<400> 43
 tcttcaacct cgtaggacaa ctctcatatg cctgggcact atttttaggt tactaccttg 60
 gctgcccttc ttaagaaaa aaaaaagaag aaaaaagaac tttccacaa gtttctcttc 120
 ctctagtgg aaaattagag aaatcatgtt ttaattttg tggtatttca gatcacaat 180
 tcaaacactt gtaaaccatta agcttctgtt caatcccctg ggaagaggat tcattctgat 240
 atttacggtt caaaagaagt tgtaatatgt tgcttggaa acagagaacc agttattaac 300
 ttcctactac tattatataa taaataataa c 331

<210> 44
 <211> 592
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (592)
 <223> n = A,T,C or G

<400> 44
 ggcttagtag ttgccaggca aaatarcgtt gattctcctc aggagccacc cccaacaccc 60
 ctgtttgctt ctagacctat acctagacta aagtcaccag agaccctag aggtgagggt 120
 cagagtgacc cttgaggaga tgtgctacac tagaaaagaa ctgcttgagt tttctaattt 180
 atataagcag aaatctggag aagagtcata ggaatggata ttaagggtgt gagataatgg 240
 cggaaggaat atagagttgg atcaggctgg acttattgat ttgaaccac taagtagaga 300
 ttctgctttt gatgttgag ctcaggaggt taaaaaagggt tttaattggt ctaatagttt 360
 atttgcttgg ttagctgaaa tatggataaa agatggccca ctgtgagcaa gctggaaatg 420
 cctgatctct ctcagtttaa tgtagaggaa gggatccaaa agtttaggga ganttgatg 480

ctggraktgg attggtcact ttgrgacctt cccwtcccag ctgggaggggt ccagaagata 540
cacccttgac caacgctttg cgaaatggat ttgtgatggc ggcaactact aa 592

<210> 45

<211> 567

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(567)

<223> n = A,T,C or G

<400> 45

ggcttagtag	ttgccattgc	gagtgcctgc	tcaacgagcg	ttgaacatgg	cggattgtct	60
agattcaacg	gatttgagtt	ttaccagcaa	agcgaaccaa	gcgcggccca	gagaattatg	120
ggttggttgg	ctttgaaaag	atggaaatcc	tgtaggccta	gtcagaaaag	ccttcttgca	180
gaacagttgg	ttctcgggcg	aacgctcatc	aagatgcccc	ttggaaaggc	tagcgtgtat	240
ttgggagagc	ctgatagcgt	gtcttctgat	gatgtttgtg	cttggacagt	gacaaaagat	300
atgcaaagca	agtcggaact	agacgtcaag	cttcgtgagc	aaattattgt	agactcctac	360
ttatactgtg	aggaatgata	gccaaggggtg	gggactttaa	gactaagggtg	gtttgtactt	420
gcgcgatga	tcccaggcag	aaagamctga	tgcgtagttt	tatacgggca	actactaagc	480
cgaattccag	cacactggcg	gccgttacta	attggatccg	anctcggtag	cagcttgatg	540
cataccttga	gttwtctata	ntgtcnc				567

<210> 46

<211> 908

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(908)

<223> n = A,T,C or G

<400> 46

gagcgaaaga	ccgagggcag	ngnntangng	cgangaagcg	gagagggcca	aaaagcaacc	60
gctttccccc	gggggtgccg	attcattaag	gcaggtggag	gacaggtttc	ccgatggaag	120
gcggcagggg	cgcaagcaat	taatgtgagt	aggccattca	ttagcaccgc	ggcttaacat	180
ttaagcttcg	ggttgggtatg	tggtgggaat	tgtgagcgga	taacaatttc	acacaggaaa	240
cagctatgac	catgattacg	ccaagctatt	taggtgacat	tatagaataa	ctcaagttat	300
gcatcaagct	tggtaccgag	ttcggatcca	ctagtaacgg	ccgccagtgt	gtggaattcg	360
gcttagtagt	tgccgaccat	ggagtgtctac	ctaggctaga	atacctgagy	tcctccctag	420
cctcactcac	attaaattgt	atcttttcta	cattagatgt	cctcagcgcc	ttattttctgc	480
tggaacwatcg	ataaattaat	cctgatagga	tgatagcagc	agattaatta	ctgagagtat	540
gttaatgtgt	catccctcct	atataacgta	tttgcattht	aatggagcaa	ttctggagat	600
aatccctgaa	ggcaaaggaa	tgaatcttga	gggtgagaaa	gccagaatca	gtgtccagct	660
gcagttgtgg	gagaagggtga	tattatgtat	gtctcagaag	tgacaccata	tgggcaacta	720
ctaagcccgga	attccagcac	actggcgggc	gttactaatg	gatccgagct	cggtaccaag	780
cttgatgcac	agcttgagta	tctatagtgt	cactaaatag	cctggcggtta	tcatggtcat	840
agctgtttcc	tgtgtgaaat	tggtatccgc	tcccaattcc	ccccaccata	cgagccggaa	900
cataaagt						908

<210> 47

<211> 480

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(480)

<223> n = A,T,C or G

<400> 47

tgccaacaag	gaaagtttta	aatttcccct	tgaggattct	tggtgatcat	caaattcagt	60
ggtttttaag	gttgttttct	gtcaaataac	tctaacttta	agccaaacag	tatatggaag	120
cacagataka	atattacaca	gataaaagag	gagttgatct	aaagtaraga	tagttggggg	180
ctttaatttc	tggaacctag	gtctcccat	cttcttctgt	gctgaggaa	ttcttggaag	240
cggggattct	aaagttcttt	ggaagacagt	ttgaaaacca	ccatgttggt	ctcagtacct	300
ttatttttta	aaagtaggtg	aacattttga	gagagaaaag	ggcttggttg	agatgaagtc	360
ccccccccc	cttttttttt	ttttagctga	aatagatacc	ctatgttnaa	rgaarggatt	420
attattttacc	atgccaytar	scacatgctc	tttgatgggc	nytccestac	cctccttaag	480

<210> 48

<211> 591

<212> DNA

<213> Homo sapien

<400> 48

aagaggggtac	cgagtgggaat	ttccgcttca	ctagtctggt	gtggctagtc	ggtttcgtgg	60
tggccaacat	tacgaacttc	caactcaacc	gttcttggtg	gttcaagcgg	gagtaccggc	120
gaggatgggtg	gcgtgaattc	tggcctttct	ttgccgtggg	atcggtagcc	gccatcatcg	180
gtatgtttat	caagatcttc	ttacttaacc	cgacctctcc	gatttacctg	cccgagccgt	240
ggtttaacga	ggggaggggg	atccagtcac	gcgagtactg	gtcccagatc	ttcgccatcg	300
tcgtgacaat	gcctatcaac	ttcgtcgtca	ataagttgtg	gaccttccga	acgggtgaagc	360
actccgaaaa	cgtccgggtg	ctgctgtgcy	gtgactccca	aaatcttgat	aacaacaagg	420
taaccgaatc	gcgctaagga	accccgcat	ctcgggtact	ctgcatatgc	gtaccctta	480
agccgaattc	cagcacactg	gcggccgtta	ctaattggat	ccgaactccg	taaccaagcc	540
tgatgcgtaa	cttgagttat	tctatagtgt	ccctaaaata	acctggcggt	a	591

<210> 49

<211> 454

<212> DNA

<213> Homo sapien

<400> 49

aagaggggtac	ctgccttgaa	attttaaagt	ctaaggaaar	tgggagatga	ttaagagttg	60
gtgtggcyta	gtcacaccaa	aatgtattta	ttacatcctg	ctcctttcta	gttgacagga	120
aagaaagctg	ctgtggggaa	aggagggata	aatactgaag	ggatttacta	aacaaatgtc	180
catcacagag	ttttcctttt	tttttttttg	agacagagtc	ttgctctgtc	acccaggctg	240
gaatgaagwg	gtatgatctc	agttgaatgc	aacctctacc	tcctaggttc	aagcgattct	300
catgcctcag	cctcctgagc	agctgggact	ataggcgcat	gctaccatgc	caggctaatt	360
tttatatttt	tattagagac	ggggtgttgc	catgttggcc	aggcaggtct	cgaactcctg	420
ggcctcagat	gatctgcccc	accgtaccct	ctta			454

<210> 50

<211> 463

<212> DNA

<213> Homo sapien

<400> 50

aagaggggtac	caaaaaaaag	aaaaaggaaa	aaaagaaaaa	caacttgtat	aaggctttct	60
gctgcataca	gctttttttt	tttaaataaa	tggtgccaac	aaatgttttt	gcattcacac	120
caattgctgg	ttttgaaatc	gtactcttca	aaggatattg	tgcagatcaa	tccaatagt	180
atgccccgta	ggttttgtgg	actgcccacg	ttgtctacct	tctcatgtag	gagccattga	240
gagactgttt	ggacatgcct	gtgttcatgt	agccgtgatg	tccggggggc	gtgtacatca	300
tgttaccgtg	gggtgggggc	tgcattggct	gctgggcata	tggctgggtg	cccatcatgc	360
ccatctgcat	ctgcataggg	tattggggcg	tttgatccat	atagccatga	ttgctgtggg	420
agccactgtt	catcattggc	tgggacatgc	tgttaccctc	tta		463

<210> 51

<211> 399

<212> DNA

<213> Homo sapien

<400> 51

cttcaacctc	ccaaagtgt	gggattacag	gactgagcca	ccacgctcag	cctaagcctc	60
tttttcacta	ccctctaagc	gatctaccac	agtgatgagg	ggctaaagag	cagtgcatt	120
tgattacaat	aatggaactt	agatttatta	attaacaatt	tttccttagc	atgttggttc	180
cataattatt	aagagtatgg	acttacttag	aaatgagctt	tcattttaag	aatttcatct	240
ttgaccttct	ctattagtct	gagcagtatg	acactatacg	tattttattt	aactaaccta	300
ccttgagcta	ttacttttta	aaaggctata	tacatgaatg	tgtattgtca	actgtaaage	360
cccacagtat	ttaattatat	catgatgtct	ttgagggtg			399

<210> 52

<211> 392

<212> DNA

<213> Homo sapien

<400> 52

cttcaacctc	aatcaacctt	ggtaattgat	aaaatcatca	cttaactttc	tgatataatg	60
gcaataatta	tctgagaaaa	aaaagtgggtg	aaagattaaa	cttgcatttc	tctcagaatc	120
ttgaaggata	tttgaataat	tcaaaagcgg	aatcagtagt	atcagccgaa	gaaactcact	180
tagctagaac	gttggaacca	tggatctaag	tccctgccct	tccactaacc	agctgattgg	240
ttttgtgtaa	acctcctaca	cgcttgggct	tggctgcctc	atttgtcaaa	gtaaaggctg	300
aaataggaag	ataatgaacc	gtgtcttttt	ggtctctttt	ccatccatta	ctctgatttt	360
acaaagaggc	ctgtattccc	ctgggtgaggt	tg			392

<210> 53

<211> 179

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(179)

<223> n = A,T,C or G

<400> 53

ttcgggtgat	gcctctcag	gctacagtga	agactggatt	acagaaaggt	gccagcgaga	60
tttcagattc	ctgtaaacct	ctaaagaaaa	ggagtcgcgc	ctcaactgat	gtagaaatga	120
ctagttcagc	atacngagac	acntctgact	ccgattctag	aggactgagt	gacctgcan	179

<210> 54

<211> 112

<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(112)
<223> n = A,T,C or G

<400> 54
ttcgggtgat gcctcctcag gctacatcat natagaagca aagtagaana atcnngtttg 60
tgcattttcc cacanacaaa attcaaatga ntggaagaaa ttggganagt at 112

<210> 55
<211> 225
<212> DNA
<213> Homo sapien

<400> 55
tgagcttccg cttctgacaa ctcaatagat aatcaaagga caactttaac agggattcac 60
aaaggagtat atccaaatgc caataaacat ataaaaagga attcagcttc atcatcatca 120
gaagwatgca aattaaaacc ataataagaa accactatgt ccactagaa tagataaaat 180
cttaaaagac tggtaaaacc aagtgttggt aaggcaagag gagca 225

<210> 56
<211> 175
<212> DNA
<213> Homo sapien

<400> 56
gctcctcttg ccttaccac acattctcaa aaacctgtta gagtcctaag cattctcctg 60
ttagtattgg gattttaccc ctgtcctata aagatgttat gtacaaaaa tgaagtggag 120
ggccataccc tgaggaggagg gagggatctc tagtggtgtc agaagcggaa gctca 175

<210> 57
<211> 223
<212> DNA
<213> Homo sapien

<400> 57
agccatttac caccatgga tgaatggatt ttgtaattct agctgttgta ttttgtgaat 60
ttgttaattt tggtgttttt ctgtgaaaca catacattgg atatgggagg taaaggagtg 120
tcccagttgc tctgggtcac tccctttata gccattactg tcttgtttct tgtaactcag 180
gttaggtttt ggtctctctt gtcctactgc aaaaaaaaaa aaa 223

<210> 58
<211> 211
<212> DNA
<213> Homo sapien

<400> 58
gttcgaagggt gaacgtgtag gtagcggatc tcacaactgg ggaactgtca aagacgaatt 60
aactgacttg gatcaatcaa atgtgactga ggaaacacct gaaggtgaag aacatcatcc 120
agtggcagac actgaaaata aggagaatga agttgaagag gtaaaagagg aggggtccaaa 180
agagatgact ttggatgggt ggtaaatggc t 211

<210> 59
<211> 208
<212> DNA
<213> Homo sapien

<400> 59
gctcctcttg ccttaccac tttgcaccca tcatcaacca tgtggccagg tttgcagccc 60
aggctgcaca tcaggggact gcctcgcaat acttcatgct gttgctgctg actgatggg
120ctgtgacgga tgtggaagcc acacgtgagg ctgtgggtgcg tgcctcgaac ctgcccatgt
180
cagtgatcat tatgggtggg aaatggct 208

<210> 60
<211> 171
<212> DNA
<213> Homo sapien

<400> 60
agccatttac caccataact aaattctagt tcaaactcca acttcttcca taaaacatct 60
aaccactgac accagttggc aatagcttct tccttcttta acctcttaga gtatttatgg 120
tcaatgccac acatttctgc aactgaataa agttggtaag gcaagaggag c 171

<210> 61
<211> 134
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(134)
<223> n = A,T,C or G

<400> 61
cgggtgatgc ctctcaggc tttgggtgtg cactcnact cactggcctc ttctccagca 60
actggtgaan atgtctcan gaaaancncc acacgcnct caggggtggg tgggaancat 120
canaatcacc nggc 134

<210> 62
<211> 145
<212> DNA
<213> Homo sapien

<400> 62
agagggtaca tatgcaacag tatataaagg aagaagtga ctgagaggaa cttcatcaag 60
gccatttaac caataagtga tagagtcaag gctcaaccca ggtgtgacgg attccaggtc 120
ccaagctcct tactgggtacc ctctt 145

<210> 63
<211> 297
<212> DNA
<213> Homo sapien

<400> 63
tgcactgaga ggaattcaaa gggtttatgc caaagaacaa accagtcctc tgcagcctaa 60
ctcatttggt tttgggctgc gaagccatgt agaggcgat caggcagtag atggtcctc 120

ccacagtcag	cgccatggtg	gtccggtaaa	gcatttggtc	aggcaggcct	cgtttcaggt	180
agacggggcac	acatcagctt	tctggaaaaa	ctttttagc	tctggagctt	tgtttttccc	240
agcataatca	tacactgtgg	aatcggaggt	cagtttagtt	ggtaaggcaa	gaggagc	297

<210> 64

<211> 300

<212> DNA

<213> Homo sapien

<400> 64

gcactgagag	gaacttccaa	tactatgttg	aataggagtg	gtgagagagg	gcattccttgt	60
cttgtgccgg	ttttcaaagg	gaatgcttcc	agcttttgcc	cattcagtat	aatattaaag	120
aatgttttac	cattttctgt	cttgccgtgt	tttctgtgtt	tttggttggtc	tcttcattct	180
ccatttttag	gcctttacat	gttaggaata	tatttctttt	aatgatactt	cacctttggt	240
atcttttgtg	agactctact	catagtgtga	taagcactgg	gttggttaagg	caagaggagc	300

<210> 65

<211> 203

<212> DNA

<213> Homo sapien

<400> 65

gtctctcttg	ccttaccac	tcacccagta	tgtagcaat	tttatergct	ttacctacga	60
aacagcctgt	atccaaacac	ttaacacact	cacctgaaaa	gttcaggcaa	caatgcctt	120
ctcatgggtc	tctctgtccc	agttctgaac	ctttctcttt	tcctagaaca	tgcatattarg	180
tcgatagaag	ttcctctcag	tgc				203

<210> 66

<211> 344

<212> DNA

<213> Homo sapien

<400> 66

tacggggacc	cctgcattga	gaaagcgaga	ctcactctga	agctgaaatg	ctgttgccct	60
tgtagtgctg	gtagcaggag	ttctgtgctt	tgtgggctaa	ggctcctgga	tgacccttga	120
catgggaaag	gcagagtgtt	gtgccccttc	tcattggcctc	gtcaaggcat	catggactgc	180
cacacacaaa	atgccgtttt	tattaacgac	atgaaattga	aggagagaac	acaattcact	240
gatgtggctc	gtaaccatgg	atatgggtcac	atacagaggt	gtgattatgt	aaagggttaat	300
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<210> 67

<211> 157

<212> DNA

<213> Homo sapien

<400> 67

gcactgagag	gaacttcgta	gggaggttga	actggctgct	gaggaggggg	aacaacaggg	60
taaccagact	gatagccatt	ggatggataa	tatgggtggt	gaggaggggac	actacttata	120
gcagaggggt	gtgtatagcc	tgaggaggca	tcacccg			157

<210> 68

<211> 137

<212> DNA

<213> Homo sapien

<400> 68
gcactgagag gaacttctag aaagtgaaag tctagacata aaataaaata aaaatttaaa 60
actcaggaga gacagcccag cacggtggct cagcctgta atcccagaac tttgggagcc 120
tgaggaggca tcaccg 137

<210> 69
<211> 137
<212> DNA
<213> Homo sapien

<400> 69
cgggtgatgc ctctcaggc tgtattttga agactatcga ctggacttct tatcaactga 60
agaatccgtt aaaaatacca gttgtattat ttctacctgt caaaatccat ttcaaagtgt 120
gaagttcttc tcagtgc 137

<210> 70
<211> 220
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)... (220)
<223> n = A,T,C or G

<400> 70
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gctgcctggc ctgacatggc acaccatcnc gtggagggca casctctgct cngcctacwa 120
cgagggcant ctcattwgaca ggttccaccc accaaactgc aagaggctca nnaagtactr 180
ccaggggtmya sggacmasgg tgggaytyca ycacwcatct 220

<210> 71
<211> 353
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)... (353)
<223> n = A,T,C or G

<400> 71
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tccanctaa atatgccaag tgacttcaca tgtttatctt aaagatgtcc aaaacgcaac 120
tgattttctc ccctaaacct gtgatggtgg gatgattaan cctgagtggt ctacagcaag 180
ttaagtcaa ggtgctaaat gaangtgacc tgagatacag catctacaag gcagtacctc 240
tcaacncagg gcaactttgc ttctcanagg gcatttagca gtgtctgaag taatttctgt 300
attacaactc acggggcggg ggggtgaatat ctantggana gnagacccta acg 353

<210> 72
<211> 343
<212> DNA
<213> Homo sapien

<400> 72

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gcactgagag gaacttccaa tacyatkatc agagtgaaca rgcarccyac agaacaggag      60
aaaatgttyg caatctctcc atctgacaaa aggctaatat ccagawtcta awaggaactt      120
aaacaaatth atgagaaaag aacaracaac ctcaawcaaaa agtgggtgaa ggawatgcts      180
aaargaagac atytattcag ccagtaaaca yatgaaaaaa aggctcatsa tcaactgawca      240
ttagagaaat gcaaatcaaa accacaatga gataccatct yayrccagtt agaaygggtga      300
tcattaaaaar stcaggaaac aacagatgct ggacaagggtg tca                      343

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<210> 73

<211> 321

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(321)

<223> n = A,T,C or G

<400> 73

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agaagggtgag aaagtctttg gttctgaagc agcttctaag atcttttcat ttgcttcatt      120
tcaaagttcc catgctgcca aagtgccatc ctttggggta ctgttttctg agctccagtg      180
ataactcatt tatacaaggg agatacccag aaaaaaagtg agcaaattctt aaaaagggtg      240
cttgagttca gccttaaata ccatcttgaa atgacacaga gaaagaanga tggtgggtgg      300
gagtggatag agaccctaac g                                              321

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<210> 74

<211> 321

<212> DNA

<213> Homo sapien

<400> 74

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gcactgagag gaacttcaga gagagagaga gagttccacc ctgtacttgg ggagagaaac      60
agaagggtgag aaagtctttg gttctgaagc agcttctaag atcttttcat ttgcttcatt      120
tcaaagttcc catgctgcca aagtgccatc ctttggggta ctgttttctg agctccagtg      180
ataactcatt tatacaaggg agatacccag aaaaaaagtg agcaaattctt aaaaagggtg      240
cttgagttca gycctaaata ccatcttgaa atgamacaga gaaagaagga tggtgggtgg      300
gagtggatag agaccctaac g                                              321

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<210> 75

<211> 317

<212> DNA

<213> Homo sapien

<400> 75

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aactcagttt ctcagttcca atcctgattc aggtgtttac cagctacaca accttaagca      120
agtcagataa ccttagcttc ctcatatgca aaatgagaat gaaaagtact catcgctgaa      180
ttgttttgag gattagaaaa acatctggca tgcagtagaa attcaattag tattcatttt      240
cattcttcta aattaaacaa ataggatttt tagtggtgga acttcagaca ccagaaatgg      300
gagtggatag agaccct                                              317

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<210> 76

<211> 244

<212> DNA

<213> Homo sapien

<400> 76

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catacttttaa	gttctgggat	acacgtgcag	catgcgcagg	tttggtgcat	aggtatacac	120
ttgccatggt	ggtttgctgc	acccatcagt	ccatcatcta	cattaggtat	ttctccta	180
gctatccctc	ccctagcccc	ttacaccccc	aacaggctct	agtgtgtgaa	gttcctctca	240
gtgc						244

<210> 77

<211> 254

<212> DNA

<213> Homo sapien

<400> 77

cgtttaggggtc	tctatccact	gaaatctgaa	gcacaggagg	aagagaagca	gtyctagtga	60
gatggcaagt	tcwtttacca	cactctttaa	catttygttt	agttttaacc	tttatttatg	120
gataataaag	gttaatatta	ataatgattt	attttaaggc	attcccraat	ttgcataatt	180
ctccttttgg	agataccctt	ttatctccag	tgcaagtctg	gatcaaagtg	atasamagaa	240
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<210> 78

<211> 355

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)... (355)

<223> n = A,T,C or G

<400> 78

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ccggatggnc	acgaagacgc	actggancac	gtgcttacgt	ccttttgctc	tgttgatggc	120
cctgagggga	cgcaggaccc	ttatgaccct	cagaatcttc	acaacgggag	atggcactgg	180
attgantccc	antgacacca	gagacacccc	aaccaccagn	atatcantat	attgatgtag	240
ttcctgtaga	nggccccctt	gtggaggaaa	gctccatnag	ttggtcacat	tcaacaggat	300
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<210> 79

<211> 406

<212> DNA

<213> Homo sapien

<400> 79

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ctgctatttg	aagtgttaatt	gagaaggaaa	atttttagcgt	gctcactgac	ctgcctgtag	120
ccccagtgc	agctaggatg	tgcatctccc	agccatcaag	agactgagtc	aagttgttcc	180
ttaagtcaga	acagcagact	cagctctgac	attctgattc	gaatgacact	gttcaggaat	240
cggaaacctg	tcgattagac	tggaacagctt	gtggcaagtg	aattttgcctg	taacaagcca	300
gattttttta	aatttatatt	gtaaataatg	tgtgtgtgtg	tgtgtgtata	tatatatata	360
tgtacagtta	tctaagttaa	tttaaaagtt	gtttggtacc	ctctta		406

<210> 80

<211> 327

<212> DNA

<213> Homo sapien

<400> 80

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agggctagga	tgatgattaa	taagagggat	gacataacta	ttagtggcag	gttagttggt	120
tgtagggctc	atggtagggg	taaaaggagg	gcaatttcta	gatcaaataa	taagaaggta	180
atagctacta	agaagaattt	tatggagaaa	gggacgcggg	cgggggatat	agggtcgaag	240
cgcactcgt	aaggggtgga	tttttctatg	tagccgttga	gttgtggtag	tcaaaatgta	300
ataattatta	gtagtaagcc	taggaga				327

<210> 81

<211> 318

<212> DNA

<213> Homo sapien

<400> 81

tagtctatgc	ggttgattcg	gcaatccatt	atttgcctgga	ttttgtcatg	tgttttgcca	60
attgcattca	taatttatta	tgcatctatg	cttgtatctc	ctaagtcatg	gtatataatc	120
catgcttttt	atgttttgtc	tgacataaac	tcttatcaga	gccctttgca	cacagggatt	180
caataaatat	taacacagtc	tacatttatt	tggtgaatat	tgcatatctg	ctgtactgaa	240
agcacattaa	gtaacaaagg	caagtggaga	gaatgaaaag	cactactcac	aacagttatc	300
atgattgcgc	atagacta					318

<210> 82

<211> 338

<212> DNA

<213> Homo sapien

<400> 82

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cgccttacct	cccactatta	acctactggg	agaactctct	gtgctagtaa	ccacgttctc	120
ctgatcaaat	atcactctcc	tacttacagg	actcaacata	ctagtacag	ccctatactc	180
cctctacata	tttaccacaa	cacaatgggg	ctcactcacc	caccacatta	acaacataaa	240
accctcattc	acacgagaaa	acaccctcat	gttcatacac	ctatccccca	ttctctcct	300
atccctcaac	cccgacatca	ttaccggggt	ttctctct			338

<210> 83

<211> 111

<212> DNA

<213> Homo sapien

<400> 83

agccatttac	cacccatcca	caaaaaaaaa	aaaaaaaaag	aaaaatatca	aggaataaaa	60
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<210> 84

<211> 224

<212> DNA

<213> Homo sapien

<400> 84

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aaggaagaaa	ggagaaaaaa	gggcatcatc	cccgttccga	agggtcaggg	aggaggaaat	120
tgagggtgat	tcacgagttg	cggacaactc	ctttgatgcc	aagcgaggtg	cagccggaga	180
ctggggagag	cgagccaatc	aggttttgaa	gttcctctca	gtgc		224

<210> 85
 <211> 348
 <212> DNA
 <213> Homo sapien

<400> 85
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 gagcagactt gtaacactct twttgtggaa tttgcaagtg gagatttcag scgctttgaa 180
 gtsaaaggta gaaaaggaaa tatcttcta taaaaactag acagaatgat tctcagaaac 240
 tcctttgtga tgtgtgcgtt caactcacag agtttaacct ttcwtttcat agaagcagtt 300
 aggaaacact ctgtttgtaa agtctgcaag tggatagaga ccctaacg 348

<210> 86
 <211> 293
 <212> DNA
 <213> Homo sapien

<400> 86
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 tttgwggycw wysktmgaaw mgyrwtatc ttcwyatmra amctagacag aaksattctc 180
 akaawstyyy ytgtagawgs tgcrttcaac tcacagagkt kaacmwtyct kytsatrgag 240
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<210> 87
 <211> 10
 <212> DNA
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<220>
 <223> Primer for amplification from breast tumor cDNA

<400> 87
 ctcttaggct 10

<210> 88
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<220>
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<400> 88
 agtagttgcc 10

<210> 89
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<220>
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<400> 89
ttccggttatg c 11

<210> 90
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<400> 90
tggtaaaggg 10

<210> 91
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<400> 91
tcggtcatag 10

<210> 92
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<400> 92
tacaacgagg 10

<210> 93
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tggattgggtc 10

<210> 94
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<210> 95
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<400> 95
ttttggtcc 10

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ggaaccaatc 10

<210> 97
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<400> 97
tcgatacagg 10

<210> 98
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<400> 98
ggtactaagg 10

<210> 99
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<400> 99
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<210> 100
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<400> 100
ctatccatgg 10

<210> 101
<211> 10
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<220>
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<400> 101
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<210> 102
<211> 10
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<400> 102
aagagggtac 10

<210> 103
<211> 10
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<220>
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<400> 103
cttcaacctc 10

<210> 104
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<400> 104
gctcctcttg ccttaccac 20

<210> 105
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<400> 105
gtaagtcgag cagtgtgatg 20

<210> 106
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<400> 106
gtaagtcgag cagtctgatg 20

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gacttagtgg aaagaatgta 20

<210> 108
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gtaattccgc caaccgtagt 20

<210> 109
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atggttgatc gatagtggaa 20

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acggggaccc ctgcattgag 20

<210> 111
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<210> 121
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<400> 121
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<400> 122
gacgcttggc cacttgacac 20

<210> 123
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gtatcgacgt agtggtctcc 20

<210> 124
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<220>
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<400> 124
tagtgacatt acgacgctgg 20

<210> 125
<211> 20
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<400> 125
cgggtgatgc ctcctcaggc 20

<210> 126
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<212> DNA
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<220>
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<400> 126
atggctattt tcgggggctg aca 23

<210> 127
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<400> 127
ccggtatctc ctcgtgggta tt 22

<210> 128
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<400> 128
ctgcctgagc cacaaatg 18

<210> 129
<211> 24
<212> DNA
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<220>
<223> Primer for amplification from breast tumor cDNA

<400> 129
ccggaggagg aagctagagg aata 24

<210> 130
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<212> DNA
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<220>
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<400> 130
tttttttttt ttag 14

<210> 131
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Predicited Th Motifs (B-cell epitopes)

<400> 131
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1 5 10 15
Gly Ile

<210> 132
<211> 22
<212> PRT
<213> Artificial Sequence

<220>
<223> Predicited Th Motifs (B-cell epitopes)

<221> VARIANT
<222> (1)...(22)
<223> Xaa = Any Amino Acid

<400> 132
Gln Gly Ala Ala Gln Lys Pro Ile Asn Leu Ser Lys Xaa Ile Glu Val
1 5 10 15
Val Gln Gly His Asp Glu
20

<210> 133
<211> 23
<212> PRT
<213> Artificial Sequence

<220>
<223> Predicited Th Motifs (B-cell epitopes)

<400> 133
 Ser Pro Gly Val Phe Leu Glu His Leu Gln Glu Ala Tyr Arg Ile Tyr
 1 5 10 15
 Thr Pro Phe Asp Leu Ser Ala
 20

<210> 134
 <211> 9
 <212> PRT
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<220>
 <223> Predicited HLA A2.1 Motifs (T-cell epitopes)

<400> 134
 Tyr Leu Leu Val Gly Ile Gln Gly Ala
 1 5

<210> 135
 <211> 9
 <212> PRT
 <213> Artificial Sequence

<220>
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<400> 135
 Gly Ala Ala Gln Lys Pro Ile Asn Leu
 1 5

<210> 136
 <211> 9
 <212> PRT
 <213> Artificial Sequence

<220>
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<221> VARIANT
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 1 5

<210> 137
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 <212> PRT
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<220>
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<400> 137

Glu Val Val Gln Gly His Asp Glu Ser

1

5

<210> 138

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Predicited HLA A2.1 Motifs (T-cell epitopes)

<400> 138

His Leu Gln Glu Ala Tyr Arg Ile Tyr

1

5

<210> 139

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Predicited HLA A2.1 Motifs (T-cell epitopes)

<400> 139

Asn Leu Ala Phe Val Ala Gln Ala Ala

1

5

<210> 140

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Predicited HLA A2.1 Motifs (T-cell epitopes)

<400> 140

Phe Val Ala Gln Ala Ala Pro Asp Ser

1

5

<210> 141

<211> 9388

<212> DNA

<213> Homo sapien

<400> 141

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<211> 419

<212> DNA

<213> Homo sapien

<400> 142

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<213> Homo sapien

<400> 144

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<210> 145

<211> 111

<212> DNA

<213> Homo sapien

<400> 145

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<210> 146

<211> 585

<212> DNA

<213> Homo sapien

<400> 146

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<210> 147

<211> 579

<212> DNA

<213> Homo sapien

<220>

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<400> 147

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<210> 148

<211> 249

<212> DNA

<213> Homo sapien

<400> 148

tgacaccttg	tccagcatct	gcaagccagg	aagagagtcc	tcaccaagat	ccccaccccg	60
ttggcaccag	gatcttggac	ttccaatctc	cagaactgtg	agaaataagt	atttgtcgct	120
aaataaatct	ttgtggtttc	agatatttag	ctatagcaga	tcaggctgac	taagagaaac	180
cccataagag	ttacatactc	attaatctcc	gtctctatcc	ccaggctctca	gatgctggac	240
aaggtgtca						249

<210> 149

<211> 255

<212> DNA

<213> Homo sapien

<400> 149

tgacaccttg	tccagcatct	gctatTTTTgt	gactTTTTtaa	taatagccat	tctgactggg	60
gtgagatggg	aactcattgt	gggtttgggc	tgcatttctc	taatgatcag	tgatattaag	120
ctttttttaa	atatgcttgt	tgaccacatg	tatatcatct	tttgagaagt	gtctgttcat	180
atcctttgcc	cactTTTTaa	TTTTTTtatc	ttgtaaattt	gtttaatttc	cttacagatg	240
ctggacaagg	tgtca					255

<210> 150

<211> 318

<212> DNA

<213> Homo sapien

<400> 150

ttacgctgca	acactgtgga	ggccaagctg	ggatcacttc	ttcattctaa	ctggagagga	60
gggaagtcca	agtccagcag	agggtgggtg	ggtagacagt	ggcactcaga	aatgtcagct	120
ggacccctgt	ccccgcatag	gcaggacagc	aaggctgtgg	ctctccaggg	ccagctgaag	180
aacaggacac	tgtctccgct	gccacaaagc	gtcagagact	cccatctttg	aagcacggcc	240
ttcttggctc	tcctgcactt	ccctgttctg	ttagagacct	ggttatagac	aaggettctc	300
cacagtgttg	cagcgtaa					318

<210> 151

<211> 323

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (323)

<223> n = A,T,C or G

<400> 151tnacgcngcn acnntgtaga ganggnaagg cnttccccac attnccccctt
catnanagaa 60
ttattcnacc aagnntgacc natgccnttt atgacttaca tgcnnactnc ntaatctgtn 120
tcnngcctta aaagcnnntc cactacatgc ntcancactg tntgtgtnac ntcatnaact 180
gtcngnaata ggggcncata actacagaaa tgcanttcac actgcttcca ntgccatcng 240
cgtgtggcct tncctactct tcttntattc caagtagcat ctctggantg cttccccact 300
ctccacattg ttgcagcnat aat 323

<210> 152

<211> 311

<212> DNA

<213> Homo sapien

<400> 152
tcaagattcc ataggctgac cagtccaagg agagttgaaa tcatgaagga gagtctatct 60
ggagagagct gtagttttga gggttgcaaa gacttaggat ggagttggtg ggtgtgggta 120
gtctctaagg ttgattttgt tcataaattt catgccctga atgccttgct tgcctcaccc 180
tggtccaagc cttagtgaac acctaaaagt ctctgtcttc ttgctctcca aacttctcct 240
gaggatttcc tcagattgtc tacattcaga tcgaagccag ttggcaaaca agatgcagtc 300
cagaggggtca g 311

<210> 153

<211> 332

<212> DNA

<213> Homo sapien

<400> 153
caagattcca taggctgacc aggaggctat tcaagatctc tggcagttga ggaagtctct 60
ttaagaaaat agtttaaaca atttgttaaa atttttctgt cttacttcat ttctgtagca 120
gttgatatct ggctgtcctt tttataatgc agagtgggaa ctttccctac catgtttgat 180
aaatgttgtc caggctccat tgccaataat gtgttggtcca aaatgcctgt ttagttttta 240
aagacggaac tccaccctt gcttgggtctt aagtatgtat ggaatgttat gataggacat 300
agtagtagcg gtggtcagcc tatggaatct tg 332

<210> 154

<211> 345

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (345)

<223> n = A,T,C or G

<400> 154
tcaagattcc ataggctgac ctggacagag atctcctggg tctggcccag gacagcaggc 60
tcaagctcag tggagaaggt ttccatgacc ctcagattcc cccaaacctt ggattgggtg 120
acattgcac tctcagaga gggaggagat gtangtctgg gcttccacag ggacctggtg 180

ttttaggatc aggggtaccgc tggcctgagg cttggatcat tcanagcctg ggggtggaat 240
ggctggcagc ctgtggcccc attgaaatag gctctggggc actccctctg ttcctanttg 300
aacttgggta aggaacagga atgtgggtcan cctatggaat cttga 345

<210> 155

<211> 295

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(295)

<223> n = A,T,C or G

<400> 155

gacgcttggc cacttgacac attaaacagt tttgcataat cactancatg tatttctagt 60
ttgctgtctg ctgtgatgcc ctgcctgat tctctggcgt taatgatggc aagcataatc 120
aaacgctggt ctggttaattc caagttataa ctggcattga ttaaagcatt atctttcaca 180
actaaactgt tcttcatana acagcccata ttattatcaa attaagagac aatgtattcc 240
aatatccttt anggccaaata tatttnatgt cccttaatta agagctactg tccgt 295

<210> 156

<211> 406

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(406)

<223> n = A,T,C or G

<400> 156

gacgcttggc cacttgacac tgcagtggga aaaccagcat gagccgctgc ccccaaggaa 60
cctcgaagcc caggcagagg accagccatc ccagcctgca ggtaaagtgt gtcacctgtc 120
aggtgggctt ggggtgagtg ggtgggggaa gtgtgtgtgc aaagggggtg tnaatgtnta 180
tgcgtgtgag catgagtgat ggctagtgtg actgcatgtc agggagtgtg aacaagcgtg 240
cgggggtgtg tgtgcaagtg cgtatgcata tgagaatatg tgtctgtgga tgagtgcatt 300
tgaaagtctg tgtgtgtgcg tgtggtcatg anggtaantt antgactgcg caggatgtgt 360
gagtgtgcat ggaacactca ntgtgtgtgt caagtggccn ancgtc 406

<210> 157

<211> 208

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(208)

<223> n = A,T,C or G

<400> 157

tgacgcttgg ccacttgaca cactaaaggg tgttactcat cactttcttc tctcctcggt 60
ggcatgtgag tgcattctatt cacttggcac tcatttgttt ggcagtgact gtaanccana 120
tctgatgcat acaccagctt gtaaattgaa taaatgtctc taatactatg tgctcacaat 180
anggtanggg tgaggagaag gggagaga 208

<210> 158
 <211> 547
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(547)
 <223> n = A,T,C or G

<400> 158
 cttcaacctc cttcaacctc cttcaacctc ctggattcaa acaatcatcc cacctcagac 60
 tccttagtag ctgagactac agactcacgc cactacatct ggctaaattt ttgtagagat 120
 agggtttcat catgttgccc tggctggtct caaactcctg acctcaagca atgtgcccac 180
 ctccagcctcc caaagtgtct ggattacagg cataagccac catgcccagt ccatntttta 240
 tctttcctac cacattctta ccacacttct ttttatgttt agatacataa atgcttacca 300
 ttatgataca attgcccaca gtattaagac agtaacatgc tgcacagggt tgtagcctag 360
 gaacagtagg caataccaca tagcttaggt gtgtggtaga ctataccatc taggtttgtg 420
 taagttagac tttatgtctg ttacacaatg acaaaacat ctaatgatgc atttctcaga 480
 atgtatcctt gtcagtaagc tatgatgtac agggaaacact gcccaaggac acagatattg 540
 tacctgt 547

<210> 159
 <211> 203
 <212> DNA
 <213> Homo sapien

<400> 159
 gctcctcttg ctttaccaac tcaccagta tgcagcaat tttatcrgct ttacctacga 60
 aacagcctgt atccaaacac ttaacacact cacctgaaaa gttcaggcaa caatcgctt 120
 ctcatgggtc tctctgctcc agttctgaac ctttctcttt tcctagaaca tgcatttarg 180
 tcgatagaag ttcctctcag tgc 203

<210> 160
 <211> 402
 <212> DNA
 <213> Homo sapien

<400> 160
 tgtaagtcga gcagtgtgat ggggtggaaca ggggtgtaag cagtaattgc aaactgtatt 60
 taaacaataa taataatatt tagcatttat agagcacttt atatcttcaa agtacttgca 120
 aacattayct aattaaatac cctctctgat tataatctgg atacaaatgc acttaaaactc 180
 aggacagggt catgagaraa gtatgcattt gaaagttggt gctagctatg ctttaaaaaac 240
 ctatacaatg atgggraagt tagagttcag attctgttgg actgtttttg tgcatttcag 300
 ttcagcctga tggcagaatt agatcatatc tgcactcgat gactytgctt gataacttat 360
 cactgaaatc tgagtgttga tcatcacact gctcgactta ca 402

<210> 161
 <211> 193
 <212> DNA
 <213> Homo sapien

<400> 161
 agcatgttga gccagacac tgaccaggag aaaaaccaac caatagaaac acgcccagac 60

actgaccagg agaaaaacca accaataaaa acaggcccg acataagaca aataataaaa 120
ttagcggaca aggacatgaa aacagctatt gtaagagcgg atatatgggt gtgtgtctgg 180
gctcaacatg cta 193

<210> 162
<211> 147
<212> DNA
<213> Homo sapien

<400> 162
tggtgagccc agacactgac caggagaaaa accaaccaat aaaaacaggc cgggacataa 60
gacaaataat aaaattagcg gacaaggaca tgaaaacagc tattgtaaga gcggtatag 120
tggtgtgtgt ctgggctcaa catgcta 147

<210> 163
<211> 294
<212> DNA
<213> Homo sapien

<400> 163
tagcatgttg agcccagaca caaatctttc cttaagcaat aaatcatttc tgcataatgtt 60
tttaaaacca cagctaagcc atgattattc aaaaggacta ttgtattggg tattttgatt 120
tggtttctta tctccctcac attatcttca tttctatcat tgacctctta tcccagagac 180
tctcaaactt ttatgttata caaatcacat tctgtctcaa aaaatatctc acccacttct 240
cttctgtttc tgcgtgtgta tgtgtgtgtg tgtgtgtctg ggctcaacat gcta 294

<210> 164
<211> 412
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1) ... (412)
<223> n = A,T,C or G

<400> 164
cgggattggc tttgagctgc agatgctgcc tgtgaccgca cccggcgtgg aacagaaaagc 60
cacctggctg caagtgcgcc agagccgccc tgactacgtg ctgctgtggg gctggggcgt 120
gatgaactcc accgccctga aggaagccca ggccaccgga taccgccgca acaagatgta 180
cggcgtgtgg tgggcccgtg cggagcccga tgtgctgtgac gtgggcgaag gcgccaaggg 240
ctacaacgcg ctggctctga acggctacgg cagcgagtcc aaggatgatcc angacatcct 300
gaaacacgtg cagacaagg gccagggcac ggggcccaca gacgaagtgg gctcgggtgct 360
gtacacccgc ggcgtgatca tccagatgct ggacaagggt tcaatcacta at 412

<210> 165
<211> 361
<212> DNA
<213> Homo sapien

<400> 165
ttgacacctt gtccagcatc tgcattctgat gagagcctca gatggctacc actaatggca 60
gaaggcaaag gagaacaggc attgtatggc aagaaaggaa gaaagagaga ggggagaaaag 120
gtgctagggt cttttcaaca accagttctt gatggaactg agagtaagag ctcaaggcca 180
gggtgtgtga ctccaaccag taatcccaac attttaggag gctgaggcag gcagatgtct 240

tgaccccatg agtttgtgac cagcctgaac aacatcatga gactccatct ctacaataat	300
tacaaaaatt aatcaggcat tgtggtatgc cctgtagtcc cagatgctgg acaagggtgc	360
a	361

<210> 166
 <211> 427
 <212> DNA
 <213> Homo sapien

<400> 166	
twgactgact catgtcccct acacccaact atcttctcca ggtggccagg catgatagaa	60
tctgatcctg acttagggga atattttctt ttacttccc atcttgattc cctgccggtg	120
agtttcctgg ttcagggtaa gaaaggagct caggccaaag taatgaacaa atccatcctc	180
acagacgtac agaataagag aacwtggacw tagccagcag aacmcaaktg aaamcagaac	240
mcttamctag gatracaamc mrrraratar ktgcycmcmc wtataataga aaccaaactt	300
gtatctaatt aaatatttat ccacygtcag ggcatttagt gttttgataa atacgctttg	360
gctaggattc ctgagggttag aatggaaraa caattgcamc gagggtaggg gacatgagtc	420
aktctaa	427

<210> 167
 <211> 500
 <212> DNA
 <213> Homo sapien
 <220>
 <221> misc_feature
 <222> (1)...(500)
 <223> n = A,T,C or G

<400> 167	
aacgtcgcat gctcccggcc gccatggccg cgggatagac tgactcatgt cccctaagat	60
agaggagaca cctgctaggt gtaaggagaa gatgggttagt tctacggagg ctccagggtg	120
ggagtagttc cctgctaagg gagggtagac tgttcaacct gttcctgctc cggcctccac	180
tatagcagat gcyagcagga gtaggagaga gggaggtaag agtcagaagc ttatgttgtt	240
tatgcgggga aacgccrtat cgggggcagc cragttatta ggggacantr tagwyartcw	300
agntagcatc caaagcgnng gagttntccc atatggttgg acctgcaggc ggccgcatta	360
gtgattagca tgtgagcccc agacacgcat agcaacaagg acctaaactc agatcctgtg	420
ctgattactt aacatgaatt attgtattta tttaacaact ttgagttatg aggcatatta	480
ttaggtccat attacctgga	500

<210> 168
 <211> 358
 <212> DNA
 <213> Homo sapien

<400> 168	
ttcategctc ggtgactcaa gcctgtaatc ccagaacttt gggaggccga ggggagcaga	60
tcacctgagg ttgggagttt gagaccagcc tggccaacat ggtgacaacc cgtctctgct	120
aaaaatacaa aaattagcca agcatggtgg catgcacttg taatcccagc tactcgggag	180
gctgaggcag gagaatcact tgaggccagg aggcagaggt tgcagtgagg cagaggttga	240
gatcatgcca ctgcactcca gcctgggcaa cagagtaaga ctccatctca aaaaaaaaaa	300
aaaaaaaaaa tgatcagagc cacaaataca gaaaaccttg agtcaccgag cgatgaaa	358

<210> 169
 <211> 1265

<212> DNA

<213> Homo sapien

<400> 169

ttctgtccac	accaatctta	gagctctgaa	agaatttgtc	tttaaataac	ttttaatagt	60
aacatgtatt	ttatggacca	aattgacatt	ttcgactatt	ttttcccaa	aaaagtcagg	120
tgaatttcag	cacactgagt	tggaatttc	ttatcccaga	agwccgcacg	agcaatttca	180
tatttattta	agattgattc	catactccgt	tttcaaggag	aatccctgca	gtctccttaa	240
aggtagaaca	aatactttct	attttttttt	caccattgtg	ggattggact	tttaagagggtg	300
actctaaaaa	aacagagaac	aaatatgtct	cagttgtatt	aagcacggac	ccatattatc	360
atattcactt	aaaaaaatga	tttcctgtgc	accttttggc	aacttctctt	ttcaatgtag	420
ggaaaaactt	agtcaccctg	aaaaccacaca	aaataaataa	aacttgtaga	tgtgggcaga	480
argtttgggg	gtggacattg	tatgtgttta	aattaaaccc	tgtatcactg	agaagctggt	540
gtatgggtca	gagaaaatga	atgcttagaa	gctgttcaca	tcttcaagag	cagaagcaaa	600
ccacatgtct	cagctatatt	attattttatt	ttttatgcat	aaagtgaatc	atttcttctg	660
tattaatttc	caaagggttt	taccctctat	ttaaatgctt	tgaaaaacag	tgcattgaca	720
atgggttgat	atttttcttt	aaaagaaaaa	tataattatg	aaagccaaga	taatctgaag	780
cctgttttat	tttaaaactt	tttatgttct	gtgggtgatg	ttgtttgttt	gtttgtttct	840
attttgttgg	ttttttactt	tgttttttgt	tttgttttgt	tttggttttg	catactacat	900
gcagtttctt	taaccaatgt	ctgtttggct	aatgtaatta	aagttgttaa	tttatatgag	960
tgcatttcaa	ctatgtcaat	ggtttcttaa	tattttattgt	gtagaagtac	tggtaatattt	1020
tttattttaca	atatgtttta	agagataaca	gtttgatatg	ttttcatgtg	tttatagcag	1080
aagttatttta	tttctatggc	attccagcgg	atattttggt	gtttgcgagg	catgcagtca	1140
atattttgta	cagtttagtg	acagtattca	gcaacgcctg	atagcttctt	tggccttatg	1200
ttaaataaaa	agacctgttt	gggatgtaaa	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	1260
aaaaa						1265

<210> 170

<211> 383

<212> DNA

<213> Homo sapien

<400> 170

tgtaagtcca	gcagtgatg	gacgatattc	ttcttattaa	tgtggtaatt	gaacaaatga	60
tctgtgatac	tgatcctgag	ctaggaggcg	ctgttcagtt	aatgggactt	cttcgtactc	120
taattgatcc	agagaacatg	ctggctacaa	ctaataaaac	cgaaaaaagt	gaattttctaa	180
attttttcta	caaccattgt	atgcatgttc	tcacagcacc	acttttgacc	aatacttcag	240
aagacaaatg	tgaaaaggat	aatatagttg	gatcaaacaa	aaacaacaca	atttgtcccc	300
ataattatca	aacagcacag	ctacttgctt	taatttttaga	gttactcaca	ttttgtgtgg	360
aacatcacac	tgctcgactt	aca				383

<210> 171

<211> 383

<212> DNA

<213> Homo sapien

<400> 171

tgggcacctt	caatatcgca	agttaaaaat	aatggtgagt	ttattatact	tttgacctgt	60
ttagctcaac	agggtgaagg	catgtaaaga	atgtggactt	ctgaggaatt	ttctttttaa	120
aagaacataa	tgaagtaaca	ttttaattac	tcaaggacta	cttttggttg	aagtattataa	180
tctagatacc	tctacttttt	gttttttgcg	ttcgacagtt	cacaaagacc	ttcagcaatt	240
tacagggtaa	aatcgttgaa	gtagtggagg	tgaaactgaa	attttaaaatt	attctgtaaa	300
tactataggg	aaagaggctg	agcttagaat	cttttggttg	ttcatgtgtt	ctgtgctctt	360
atcatcacac	tgctcgactt	aca				383

<210> 172
 <211> 699
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)... (699)
 <223> n = A,T,C or G

<400> 172
 tcgggtgatg cctcctcagg cttgtcggtta gtgtacacag agctgctcat gaagcgacag 60
 cggctgcccc tggcacttca gaacctcttc ctctacactt ttggtgcgct tctgaatcta 120
 ggtctgcatg ctggcggcgg ctctggccca ggctcctcgg aaagtttctc aggatgggca 180
 gcactcgtgg tgctgagcca ggactctca tgtctgctgt catggagcat 240
 ggcagcagca tcacacgcct ctttgtggtg tctgtctcgc tgggtggtaa cgccgtgctc 300
 tcagcagtcg tgctacggct gcagctcaca gccgccttct tcttggccac attgctcatt 360
 ggcttggcca tgcgcctgta ctatggcagc cgctagtccc tgacaacttc caccctgatt 420
 ccggaccctg tagattgggc gccaccacca gatccccctc ccaggccttc ctccctctcc 480
 catcagcggc cctgtaacaa gtgccttggt agaaaagctg gagaagtgaag ggcagccagg 540
 ttattctctg gaggttggtg gatgaagggg tacccttagg agatgtgaag tgtgggtttg 600
 gttaaggaaa tgcttaccat cccccacccc caaccaagtt nttccagact aaagaattaa 660
 ggtaacatca atacctaggc ctgaggaggc atcacccga 699

<210> 173
 <211> 701
 <212> DNA
 <213> Homo sapien

<400> 173
 tcgggtgatg cctcctcagg ccagatcaaa cttgggggttg aaaactgtgc aaagaaatca 60
 atgtcggaga aagaattttg caaaagaaaa atgcctaata agtactaatt taatagggtca 120
 cattagcagt ggaagaagaa atgttgatat tttatgtcag ctattttata atcaccagag 180
 tgcttagctt catgtaagcc atctcgtatt cattagaaat aagaacaatt ttattcgtcg 240
 gaaagaactt ttcaatttat agcatcttaa ttgtcagga ttttaaattt tgataaagaa 300
 agctccactt ttggcaggag tagggggcag ggagagagga ggctccatcc acaaggacag 360
 agacaccagg gccagtaggg tagctggttg ctggatcagt cacaacggac tgacttatgc 420
 catgagaaga aacaacctcc aaatctcagt tgcttaatac aacacaagct catttcttgc 480
 tcacgttaca tgtcctatgt agatcaacag caggtgaactc agggacccag gctccatctc 540
 catatgagct tccatagtca ccaggacacg ggctctgaaa gtgtcctcca tgcagggaca 600
 catgcctctt cctttcattg ggcagagcaa gtcacttatg gccagaagtc aactgcagg 660
 gcagtgccat cctgctgtat gcctgaggag gcataccccg a 701

<210> 174
 <211> 700
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)... (700)
 <223> n = A,T,C or G

<400> 174
 tcgggtgatg cctcctcang cccctaaatc agagtccagg gtcagagcca caggagacag 60

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ggaaagacat agattttaac cggccccctt caggagattc tgaggctcag ttcactttgt 120
tgcagtttga acagaggcag caaggctagt ggttaggggc acggtctcta aagctgcact 180
gcctggatct gcctcccagc tctgccagga accagctgcg tggccttgag ctgctgacac 240
gcagaaagcc ccctgtggac ccagtctcct cgtctgtaag atgaggacag gactctagga 300
accctttccc ttggtttggc ctcactttca caggctccca tcttgaactc tatctactct 360
tttcctgaaa ccttgtaaaa gaaaaaagtg ctagcctggg caacatggca aaaccctgtc 420
tctacaaaaa atacaaaaat tagttgggtg tggtagcatg tgcctgtagt cccagccact 480
tgggaggtgc tgagggtggga ggatcacttg agcccgggag gtggaggttg cagtgaacca 540
agatcatgcc actgcactcc agcctgagta atagagtaag actctgtctc aaaaacaaca 600
acaacaacag tgagtgtgcc tctgtttccg ggttggatgg ggcaccacat ttatgcatct 660
ctcagatttg gacgctgcag cctgaggagg catcacccga 700

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<210> 175

<211> 484

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(484)

<223> n = A,T,C or G

<400> 175

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tatagggcga attggggccc agttgcatgn tcccggccgc catggccgcg ggattcgggt 60
gatgcctcct caggcttgct tgccacaagc tacttctctg agctcagaaa gtgcccttg 120
atgagggaaa atgtcctact gcactgcgaa tttctcagtt ccattttacc tcccagtcct 180
ccttctaaac cagttaataa attcattcca caagtattta ctgattacct gcttgtgcca 240
gggactatct tcaggctgaa gaagggtggga ggggagggcg gaacctgagg agccacctga 300
gccagcttta tatttcaacc atggctggcc catctgagag catctcccca ctctcgccaa 360
cctatcgggg catagcccag ggatgcccc aggcggccca ggtagatgc gtcccttttg 420
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<210> 176

<211> 432

<212> DNA

<213> Homo sapien

<400> 176

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gacaaatgcc aggtagcgga attggtactg gtccaggagt tatccaggat agattttcac 180
ccaccatggg acgtcatcgt tcaaatcaac tcttcaatgg ccatggggga cacatcatgc 240
ctccacaca atcgagttt ggagagatgg gaggcaagtt tatgaaaagc caggggctaa 300
gccagctcta ccataaccag agtcagggac tcttatccca gctgcaagga cagtgaagg 360
atatgccacc tcggttttct aagaaaggac agcttaatgc agatgagatt agcctgagga 420
ggcatcacc ga 432

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<210> 177

<211> 788

<212> DNA

<213> Homo sapien

<400> 177

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tggcaatgcc	agtggaaacca	cgctgcttga	ggctctggac	tgcatcctac	caccaactcg	180
cccaactgac	aagcccttgc	gcctgcctct	ccaggatgtc	tacaaaattg	gtgggtattgg	240
tactgttctt	gttggccgag	tggagactgg	tggtctcaaa	cccgggtatgg	tggtcacctt	300
tgtccagtc	aacgtttaca	cggaagtaaa	atctgtcgaa	atgcaccatg	aagctttgag	360
tgaagctctt	cctggggaca	atgtgggctt	caatgtcaag	aatgtgtctg	tcaaggatgt	420
tcgtcgtggc	aacgttgctg	gtgacagcaa	aaatgaccca	ccaatggaag	cagctggctt	480
cactgctcag	gtgattatcc	tgaacctacc	aggccaaata	agtgcgggct	atgcccctgt	540
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cattgttgat	atggttcctg	gcaagcccat	gtgtgttgag	agcttctcag	actatccacc	720
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acatgcta						788

<210> 178
 <211> 786
 <212> DNA
 <213> Homo sapien

<400> 178						
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attgttgctt	gtttcttttc	attaaagggt	taatcagaca	gatcagacag	cataattttg	180
tatttaata	cagaaacgtt	ggtacatttc	ttcatgaatg	agcttgcat	ctgaagcaag	240
agcctacaaa	aggcacttgt	tataaatgaa	agttctggct	ctagaggcca	gtactctgga	300
gtttcagagc	agccagtgat	tggtccagtc	agtgatgcct	agttatatag	aggaggagta	360
cactgtgcac	tcttctaggt	gtaagggtat	gcaactttgg	atcttaaaat	tctgtacaca	420
tacacacttt	atatatatgt	atgtatgtat	gaaaacatga	aattagtttg	tcaaatatgt	480
gtgtgtttag	tatttttagct	tagtgcaact	atttccacat	tatttattaa	attgatctaa	540
gacactttct	tgttgacacc	ttgaatatta	atgttcaagg	gtgcaatgtg	tattccttta	600
gattgttaaa	gcttaattac	tatgattttg	agtaaattaa	cttttaaaat	gtatttgagc	660
ccttctgtag	tgctgtaggg	ctcttacagg	gtgggaaaga	ttttaatttt	ccagttgcta	720
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atgcta						786

<210> 179
 <211> 796
 <212> DNA
 <213> Homo sapien

<400> 179						
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acacccccat	ccgccccttg	tttggagtgc	agagtttggc	tttgggtctt	tgccctgcct	180
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cccaggccag	gtttccactc	atttattact	ttatgtttct	gttccattgc	tggtccacag	300
aaataagttt	tcctttggag	gaatgtgatt	atcccccttt	aatttctctc	ttttgctttt	360
ttttaataat	attggtatgt	gtttggccca	gaggaaactg	aaattcacca	tcattctgac	420
tggcaatccc	attaccatgc	tttttttaaa	aaacgtaatt	tttcttgcc	tacattggca	480
gagtgcctct	tcctggctac	tggtctaatg	tagtcactca	gtttctaggt	ggcattaggg	540
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aaagggtcat	gtcaggtttc	aatgctatct	gcttctgttc	ctgctcactg	ttctggattt	660
tgctcttctt	catccctagc	accagaattt	cccagctctc	ctccctacct	tccctgtttt	720
taattctaat	ctatcagcaa	aataactttt	caaagtgttt	aaccgggtatc	tccatgtgtc	780
tgggctcaac	atgcta					796

<210> 180
<211> 488
<212> DNA
<213> Homo sapien

<400> 180
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catgctcccg gccgccatgg ccgcgggata gcatgttgag ccagacacc tgcaggatcat 180
ttggagagat ttttcacgtt accagcttga tggctctttt caggaggaga gacactgagc 240
actcccaagg tgaggttgaa gatttcctct agatagccgg ataagaagac taggagggat 300
gcctagaaaa tgattagcat gcaaatttct acctgccatt tcagaactgt gtgtcagccc 360
acattcagct gcttcttgtg aactgaaaag agagaggat tgagactttt ctgatggccg 420
ctctaacatt gtaacacagt aatctgtgtg tgtgtgggtg tgtgtgtgtg tctgggctca 480
acatgcta 488

<210> 181
<211> 317
<212> DNA
<213> Homo sapien

<400> 181
tagcatgttg agcccagaca cggcgacggg acctgatgag tggggtgatg gcacctgtga 60
aaaggaggaa cgtcatcccc catgatattg gggaccaga tgatgaacca tggctccgctg 120
tcaatgcata tttaatccat gatactgctg attggaagga cctgaacctg aagtttgtgc 180
tgcagggttta tgggactat tacctcacgg gtgatcaaaa ctctctgaag gacatgtggc 240
ctgtgtgtct agtaagggat gcacatgcag tggccagtgt gccaggggta tggttggtgt 300
ctgggctcaa catgcta 317

<210> 182
<211> 507
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)... (507)
<223> n = A,T,C or G

<400> 182
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agcagagagc accacataca ttagaatggg aaggactgcc acctccttca agaacaggag 180
tgagggtggt ggtgaatggg aatggaagcc tgcattccct gatgcatttg tgctctctca 240
aatcctgtct tagtcttagg aaaggaagta aagtttcaag gacggttccg aactgctttt 300
tgtgtctggg ctcaacatgc tatccgcggg ccatggcggc cgggagcatg cgacgtcggg 360
cccaattcgc cctatagtga gtcgtattac aattcactgg ccgtcgtttt acaacgtcgt 420
gactgggaaa acctggcgt tacccaactt aatgcgcttg cagcacatcc ccttttccca 480
gctggcgtaa tancgaaaag gcccgca 507

<210> 183
<211> 227
<212> DNA
<213> Homo sapien

<400> 183

gattttacgct	gcaacactgt	ggaggtagcc	ctggagcaag	gcaggcatgg	atgcttctgc	60
aatcccaaaa	tgagcctgg	tatttcagcc	aggaatctga	gcagagcccc	ctctaattgt	120
agcaatgata	agttattctc	tttggtcttc	aaccttccaa	tagccttgag	cttccagggg	180
agtgtcgta	atcattacag	cctggtctcc	acagtgttgc	agcgtaa		227

<210> 184

<211> 225

<212> DNA

<213> Homo sapien

<400> 184

ttacgctgca	acactgtgga	gcagattaac	atcagacttt	tctatcaaca	tgactggggg	60
tactaaaaag	acaacaaatc	aatggcttca	aaagtctaag	gaataatttc	gatacttcaa	120
ctttataaaa	cctgacaaaa	ctatcaatca	agcataaaga	cagatgaaga	acatttccag	180
attttgGCCA	atcagatatt	ttacctccac	agtgttgCag	cgtaa		225

<210> 185

<211> 597

<212> DNA

<213> Homo sapien

<400> 185

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ctggggaccca	taggctagtc	agagtattta	gagttgagtt	cctttctgct	ccccagaatt	120
tgaaagaaaa	ggagttaggt	gatagagctg	agagatcaga	tttgccctcg	aagcctgttc	180
aagatgtatg	tgctcagacc	ccaccactgg	ggcctgtggg	tgaggctcctg	ggcatctatt	240
tgaatgaatt	gctgaagggg	agcactatgc	caaggaaggg	gaacccatcc	tggcactggc	300
acaggggtca	ccttatccag	tgctcagtgc	ttctttgctg	ctacctgggt	ttctctcata	360
tgtgaggggc	aggttaagaag	aagtgcccrG	tgttgtgcga	gttttagaac	atctaccagt	420
aagtgggggaa	gtttcacaaa	gcagcagcct	tgttttgtgt	attttcacct	tcagttagaa	480
gaggaaggct	gtgagatgaa	tgtagttga	gtggaaaaga	cgggtaagct	tagtggatag	540
agaccctaac	gaatcactag	tgcggccgcc	ttgcaggctc	accatatggg	agagctc	597

<210> 186

<211> 597

<212> DNA

<213> Homo sapien

<400> 186

ggcccgaaagt	tgcatgttcc	cggccgccat	ggcccgcgga	ttcgttaggg	tctctatcca	60
ctacctaaaa	aatcccaaac	atataactga	actcctcaca	cccaattgga	ccaatccatc	120
acccagagg	cctacagatc	ctcctttgat	acataagaaa	atttcccaa	actacctaac	180
tatatcattt	tgcaagattt	gttttaccaa	attttgatgg	cctttctgag	cttgtcagtg	240
tgaaccacta	ttacgaacga	tcggatatta	actgcccctc	accgtccagg	tgtagctggc	300
aacatcaagt	gcagtaaata	ttcattaagt	tttcacctac	taagggtgctt	aaacacccta	360
gggtgccatg	tcggtagcag	atcttttgat	ttgtttttat	ttcccataag	ggcctgttcc	420
aaggtaatc	atacatgtag	tgtgagcagc	tagtcactat	cgcatagactt	ggagggatgat	480
aatagaggcc	tcctttgctg	ttaaagaact	cttgtcccag	cctgtcaaag	tgatagaga	540
ccctaacgaa	tcactagtgc	ggccgcctgc	aggtcgacca	tatgggagag	ctcccaa	597

<210> 187

<211> 324

<212> DNA

<213> Homo sapien

<400> 187

tcgttagggt ctctatccac ttgcaggtaa aatccaatcc tgtgtatata ttatagtctt	60
ccatatgtag tgggtcaaga gactgcagtt ccagaaagac tagccgagcc catccatgtc	120
ttccacttaa ccttgctttg ggttacacat cttaactttt ctgttcaagt ttctctgtgt	180
agtttatagc atgagtattg ggawaatgcc ctgaaacctg acatgagatc tgggaaacac	240
aaacttactc aataagaatt tctcccatat ttttatgatg gaaaaatttc acatgcacag	300
aggagtggat agagacccta acga	324

<210> 188

<211> 178

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (178)

<223> n = A,T,C or G

<400> 188

gcgcgggggat tcgggggtgat acctcctcat gccaaaatac aacgtntaat ttcacaactt	60
gccttccaat ttacgcattt tcaatttgct ctccccattt gttgagtcac aacaaacacc	120
attgccccaga aacatgtatt acctaacatg cacatactct taaaactact catccctt	178

<210> 189

<211> 367

<212> DNA

<213> Homo sapien

<400> 189

tgacaccttg tccagcatct gacacagtct tggctcttgg aaaatattgg ataatgaaa	60
atgaatttct ttagcaagtg gtataagctg agaataacg tatcacatat cctcattcta	120
agacacattc agtgtccctg aaattagaat aggacttaca ataagtgtgt tcactttctc	180
aatagctgtt attcaattga tggtaggcct taaaagtcaa agaaatgaga gggcatgtga	240
aaaaaagctc aacatcactg atcattagaa aacttccatt caaaccccca atgagatacc	300
atctcatacc agtcagaatg gctattatta aaaagtcaaa aaataacaga tgctggacaa	360
ggtgtca	367

<210> 190

<211> 369

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (369)

<223> n = A,T,C or G

<400> 190

gacaccttgt ccagcatctg acaacgctaa cagcctgagg agatctttat ttattttattt	60
agtttttact ctggctaggg agatgggtggc taaaacattc atttaccat ttattcattt	120
aattgttctt gcaaggccta tggatagagt attgtccagc actgctctgg aagctaggag	180
catggggatg aacaagatag gctacatcct gttcccacag aacttccact ttagtctggg	240
aaacagatga tatatacaaa tatataaatg aattcaggta gttttaagta cgaaaagaat	300

aagaaagcag agtcatgatt tanaatgctg gaaacagggg ctattgcttg agatattgaa 360
 ggtgcccaa 369

<210> 191
 <211> 369
 <212> DNA
 <213> Homo sapien

<400> 191
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 ctacagaatg ggagaaaatt tttgcaatct atccatctga caaagggcta atatccagaa 120
 tctacaaaga acttatacaa atttacaaga aacaaacaaa caaacaactc ctcaaaaagt 180
 ggggtgaagga tgtgaacaga cactttctcaa aagaagacat ttatggggcc aacaaacata 240
 tgaaaaaaag ctcacatca ctggctacta gataaatgca aatcaaaacc acaatgagat 300
 accatctcat tccagttaga atggcaatca ttaaaaagtc aggaaacaac agatgctgga 360
 caaggtgtc 369

<210> 192
 <211> 449
 <212> DNA
 <213> Homo sapien

<400> 192
 tgacgcttgg ccacttgaca cttcatcttt gcacagaaaa acttctttac agatttaatt 60
 caagactggt ctagtgcag tcctccagac attttttcat ttgttccata tacgtggaat 120
 tttaaaatca tgtttcatca gtttgaaatg atttgggctg ctaatcaaca caattggatc 180
 gactgttcta ctaaacaaca ggaaaatgtg tatctggcag cctgtggaga aacactaaac 240
 attgattttt ctttgccttt tacggacttt gttccagcta catgtaatac caagttctct 300
 ttaagaggag aagatgttga tcttcatttg tttctaccag actgccacc tagtaaatat 360
 tctttattta tgctggtaaa aaattgccat ccaaataaga tgattcatga tactggtatt 420
 cctgctgagt gtcaagtggc caagcgtca 449

<210> 193
 <211> 372
 <212> DNA
 <213> Homo sapien

<400> 193
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 tattggcaat ttcccatcaa acattctaga aagagacaac caggattgct aggccataaa 120
 agctgcaata aataactggt aattgcagta atcatttcag gccaatcaa tccagtttgg 180
 ctcagaggtg cttttggctg agagaagagg tgagatataa tgtgttttct tgcaacttct 240
 tggaagaata actccacaat agtctgagga ctagatacaa acctatttgc cattaagca 300
 ccagagtctg ttaattccag tactgataag tgttgagat tagactccag tgtgtcaagt 360
 ggccaagcgt ca 372

<210> 194
 <211> 309
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)... (309)
 <223> n = A,T,C or G

<400> 194
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 ttaggcttag tggttgggc accttcaata tcacactaga gacaaacgcc acaagatctg 120
 cagaaacatt cagttctgan cactogaatg gcaggataac tttttgtgtt gtaatccttc 180
 acatatacaa aaacaaactc tgcantctca cgttacaaaa aaacgtactg ctgtaaaata 240
 ttaagaaggg gtaaaggata ccatctataa caaagtaact tacaactagt gtcaagtggc 300
 caagcgta 309

<210> 195
 <211> 312
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)... (312)
 <223> n = A,T,C or G

<400> 195
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 ggactgcaac tatcccact tcccagatga ggggaccaan gtacacatta ggaccggat 120
 gggagcacag atttgccga tcccagactc caagcactca gcgtcactcc aggacagcgg 180
 ctttcagata aggtcacaaa catgaatggc tccgacaacc ggagtcagtc cgtgctgagt 240
 taaggcaatg gtgacacgga tgcacgtgtn acctgtaatg gttcatcgta agtgtcaagt 300
 ggccaagcgt ca 312

<210> 196
 <211> 288
 <212> DNA
 <213> Homo sapien

<400> 196
 tgtatcgacg tagtgggtctc ctcagccatg cagaactgtg actcaattaa acctctttcc 60
 tttatgaatt acccaatctc gggtagtgtc tttatagtag tgtgagaatg gactaatata 120
 agtacatttt acttagtaat aataataaac aaatatatta catttttgtg tattttactac 180
 accatatttt ttattgttat tgtagtgtac accttctact tattaaaaga aataggcccg 240
 aggcgggacg atcacgaggt caggagatgg agaccactac gtcgatac 288

<210> 197
 <211> 289
 <212> DNA
 <213> Homo sapien

<400> 197
 ttgggcacct tcaatatcat gacaggtgat gtgataacca agaaggctac taagtgatta 60
 atgggtgggt aatgtatata gagtaggtac actggacaga ggggtaattc atagccaagg 120
 caggagaagc agaatggcaa aacattttcat cacactactc aggatagcat gcagtttaaa 180
 acctataagt agtttatttt tggaattttc cacttaatat tttcagactg caggtaacta 240
 aactgtggaa cacaagaaca tagataaggg gagaccacta cgtcgatac 289

<210> 198
 <211> 288
 <212> DNA
 <213> Homo sapien

<400> 198

gtatcgacgt	agtggctctcc	caagcagtg	gaagaaaacg	tgaaccaatt	aaaatgtatc	60
agatacccca	aagaaaggcg	cttgagtaaa	gattccaagt	gggtcacaat	ctcagatctt	120
aaaattcagg	ctgtcaaaga	gatttgctat	gaggttgctc	tcaatgactt	caggcacagt	180
cggcaggaga	ttgaagccct	ggccattgtc	aagatgaagg	agctttgtgc	catgtatggc	240
aagaaagacc	ccaatgagcg	ggactcctgg	agaccactac	gtcgatac		288

<210> 199

<211> 1027

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(1027)

<223> n = A,T,C or G

<400> 199

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aanccacagg	tttcccatt	cagggaggtg	taaaaagncg	gccaggggat	tgtaanagga	120
ttcaataata	gggggaatgg	gcccngaagt	tgcaagggtc	cngcccgcga	tgncgcggg	180
atttagtgac	attacgacgs	tggtataaaa	gtgggsccaa	waaatatttg	tgatgtgatt	240
tttsgaccag	tgaaccatt	gwacaggacc	tcatttccty	tgagatgrta	gccataatca	300
gataaaaagrt	tagaagtytt	tctgcacgtt	aacagcatca	ttaaattggag	tggcatcacc	360
aatttcaccc	tttgttagcc	gataccttcc	ccttgaaggc	attcaattaa	gtgaccaatc	420
gtcatacgag	aggggatggc	atggggattg	atgatgatat	caggggtgat	accttcacag	480
gtgaaaggca	tatcctcttg	tctatactga	ataccacaag	tacccttttg	accatgtcga	540
ctagcaaatt	tgtctccaat	ctgtgtwatc	cctaacagag	cgtaccctta	ttttacaaaa	600
tttatatcct	tcctgattga	gagttaccat	aacctgatcc	acaatgcccg	tctcgctwgt	660
tctgagaaaa	gtgctacagt	ctctcttggt	atagcgtcta	ttggtgctct	ccaattcatc	720
ttcatttttc	aggcaagggtg	aactgttttg	octataataa	cmtcatctcc	tgatacmega	780
aacccckgga	rctatcaaac	catcatcatc	cagcgttckt	watgtymcta	aatccctatt	840
gcggccgcct	gcagggtcaac	atatnggaaa	acccccacc	ccttnggagc	ntaccttgaa	900
ttttccatat	gtcccntaaa	ttancctngnc	ttancctggc	cntaacctnt	tccggtttaa	960
attgtttccg	ccccnttcc	cnccttnna	accggaaacc	ttaattttna	accnggggtt	1020
cctatcc						1027

<210> 200

<211> 207

<212> DNA

<213> Homo sapien

<400> 200

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cacttggtta	agcctgatcc	ctctggttta	tcacaaagaa	taggatggga	taaagaaagt	120
ggacacttaa	ataagctata	aattatatgg	tccttgctta	gcaggagaca	actgcacagg	180
tatactacca	gcgtcgtaat	gtcacta				207

<210> 201

<211> 209

<212> DNA

<213> Homo sapien

<400> 201

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tgggcacctt caatatctat taaaagcaca aatactgaag aacacaccaa gactatcaat    60
gaggttacat ctggagtcct cgatatatca ggaaaaaatg aagtgaacat tcacagagtt    120
ttacttcttt gggaactcaa atgctagaaa agaaaagggg gccctctttc tctggcttcc    180
tggtcctatc cagcgtcgtg atgtcacta                                     209

```

```

<210> 202
<211> 349
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1) ... (349)
<223> n = A,T,C or G

```

```

<400> 202
ntacgctgca acactgtgga gccactgggt tttattcccg gcaggttatc cagcaaacag    60
tcactgaaca caccgaagac cgtgggtatg taaccgttca cagtaatcgt tccagtcgtc    120
tgcgggaccc cgacgagcgt cactgggtac agaccagatt cagccggaag agaaagcgcc    180
gcagggagag actcgaactc cactccgctg gtgagcagcc ccattgtttc aactcgaagt    240
tcaaacggca ttgggttata taccatcagc tgaacttcac acacatctcc ttgaaccac    300
tggaatcta tttctctgtt ccgctcttct ccacagtgtt gcagcgtaa                349

```

```

<210> 203
<211> 241
<212> DNA
<213> Homo sapien

```

```

<400> 203
tgctcctctt gccttaccaa cccaaagccc actgtgaaat atgaagtga tgacaaaatt    60
cagttttcaa cgcaatatag tatagtttat ctgattcttt tgatctccag gacactttaa    120
acaactgcta ccaccaccac caacctaggg atttaggatt ctccacagac cagaaattat    180
ttctcctttg agtttcaggc tctctgga ctctgttca tcaatgggtg gtaaatggct    240
a                                     241

```

```

<210> 204
<211> 248
<212> DNA
<213> Homo sapien

```

```

<400> 204
tagccattta ccaccatct gcaaaccswg acmwwcargr cywgwackya ggcgatttga    60
agtactggta atgctctgat catgttagtt acataagtgt ggtcagtta caaaaattca    120
cagaactaaa tactcaatgc tatgtgttca tgtctgtgtt tatgtgtgtg taatgtttca    180
attaagtttt tttaaaaaaa agagatgatt tccaaataag aaagccgtgt tggttaaggca    240
agaggagc                                     248

```

```

<210> 205
<211> 505
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1) ... (505)

```

<223> n = A,T,C or G

<400> 205

tacgctgcaa	cactgtggag	ccattcatac	aggtcacctaa	ttaaggaaca	agtgattatg	60
ctacctttgc	acggttaggg	taccgcggcc	gttaaaccatg	tgtcactggg	caggcgggtgc	120
ctctaatact	ggtgatgcta	gaggtgatgt	ttttggtaaa	caggcgggggt	aagatttgcc	180
gagttccctt	tacttttttt	aacctttcct	tatgagcatg	cctgtgttgg	gttgacagtg	240
ggggtaataa	tgacttggtg	gttgattgta	gatattgggc	tgtaattgt	cagttcagtg	300
ttttaatctg	acgcaggctt	atgcggagga	gaatgttttc	atgttactta	tactaacatt	360
agttcttcta	tagggtgata	gattgggtcca	attgggtgtg	aggagttcag	ttatatgttt	420
gggatttttt	aggtagtggg	tggtganctt	gaacgccttc	ttaattgggtg	gctgctttta	480
rgcctactat	gggtggtaaa	tggt				505

<210> 206

<211> 179

<212> DNA

<213> Homo sapien

<400> 206

tagactgact	catgtcccct	accaaagccc	atgtaaggag	ctgagttcct	aaagactgaa	60
gacagactat	tctctggaga	aaaataaaat	ggaaattgta	ctttaaaaaa	aaaaaaaatc	120
ggccgggcat	ggtagcacac	acctgtaatc	ccagctacta	ggggacatga	gtcagtcta	179

<210> 207

<211> 176

<212> DNA

<213> Homo sapien

<400> 207

agactgactc	atgtccccta	ccccaccttc	tgctgtgctg	ccgtgttcct	aacaggtcac	60
agactggtag	tggtcagtgg	cctggggggt	ggggacctct	attatatggg	atacaaattt	120
aggagttgga	attgacacga	tttagtgact	gatgggatat	gggtggtaaa	tggtcta	176

<210> 208

<211> 196

<212> DNA

<213> Homo sapien

<400> 208

agactgactc	atgtccccta	tttaacaggg	tctctagtgc	tgtgaaaaaa	aaaaatgctg	60
aacattgcat	ataacttata	ttgtaagaaa	tactgtacaa	tgactttatt	gcatctgggt	120
agctgtaagg	catgaaggat	gccaagaagt	ttaaggaata	tggtgggtaa	atggctaggg	180
gacatgagtc	agtcta					196

<210> 209

<211> 345

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (345)

<223> n = A,T,C or G

<400> 209

gacgcttggc	cacttgacac	cttttatctt	ttaaggattc	ttaagtcatt	tangtnactt	60
tgtaagtttt	tcctgtgccc	ccataagaat	gatagcttta	aaaattatgc	tggggtagca	120
aagaagatac	ttctagcttt	agaatgtgta	ggtatagcca	ggattcttgt	gaggaggggt	180
gatttagagc	aaatttctta	ttctccttgc	ctcatctgta	acatggggat	aataatagaa	240
ctggcttgac	aaggttgga	ttagtattac	atggtaaata	catgtaaaat	gtttagaatg	300
gtgccaagta	tctaggaagt	acttgggcat	gggtggtaaa	tggct		345

<210> 210
 <211> 178
 <212> DNA
 <213> Homo sapien

<400> 210	
gacgcttggc	cacttgacac tagagtaggg tttggccaac tttttctata aaggaccaga 60
gagtaaata	ttcaggcttt gtgggttggt cagtctctct tgcaactact cagctctgcc 120
attgtagcat	agaaatcagc catagacagg acagaaatga atgggtggta aatggcta 178

<210> 211
 <211> 454
 <212> DNA
 <213> Homo sapien

<400> 211	
tgggcacctt	caatatctat ccagcgcac taaattcgt tttttcttga ttaaaaaattt 60
caccacttgc	tggttttgct catgtatacc aagtagcagt ggtgtgaggc catgcttggt 120
ttttgattcg	atatcagcac cgtataagag cagtgccttg gccattaatt tatcttcatt 180
gtagacagca	tagttagag tggtagatct atactcatct ggaatatttg gatcagtgcc 240
atgttccagc	aacattaacg cacattcatc ttcttggcat tgtaaggcct ttgtcagagc 300
tgctctcttt	ttgttgtaaa ggacattaag ttgacatcgt ctgtccagca cgagttttac 360
tacttctgaa	ttccatttgg cagaggccag atgtagagca gtctctcttt gcttgtccct 420
cttgttcaca	tcagtgtccc tgagcataac ggaa 454

<210> 212
 <211> 337
 <212> DNA
 <213> Homo sapien

<400> 212	
tccgttatgc	caccagaaa acctactgga gttacttatt aacatcaagg ctggaacctt 60
tttgccctcag	tcctatctga ttcattgagc catgggttatt actgatcgca ttgaaaacat 120
tgatcacctg	ggtttcttta tttatcgact gtgtcatgac aaggaaactt acaaactgca 180
acgcagagaa	actattaaag gtattcagaa acgtgaagcc agcaattgtt tcgcaattcg 240
gcattttgaa	aacaaatttg ccgtggaaac tttaatttgt tcttgaacag tcaagaaaaa 300
cattattgag	gaaaattaat atcacagcat aacggaa 337

<210> 213
 <211> 715
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (715)
 <223> n = A,T,C or G

```

<400> 213
tcgggtgatg cctcctcagg catcttccat ccatctcttc aagattagct gtcccaaagt      60
tttttccttc tcttctttac tgataaattt ggactccttc ttgacactga tgacagcttt      120
agtatccttc ttgtcacctt gcagacttta aacataaaaa tactcattgg ttttaaaagg      180
aaaaaagtat acattagcac tattaagctt ggccttgaaa cattttctat cttttattaa      240
atgtcgggta gctgaacaga attcatttta caatgcagag tgagaaaaga agggagctat      300
atgcatttga gaatgcaagc attgtcaaata aaacatttta aatgctttct taaagtgagc      360
acatacagaa atacattaag atattagaaa gtgtttttgc ttgtgtacta ctaattaggg      420
aagcaccttg tatagttcct cttctaaaat tgaagtagat tttaaaaacc catgtaattt      480
aattgagctc tcagttcaga ttttaggaga attttaacag ggatttggtt ttgtctaaat      540
tttgtcaatt tntttagtta atctgtataa ttttataaat gtcaaaactgt atttagtccg      600
ttttcatgct gctatgaaag aaatacccan gacagggtta tttataaang gaaagangtt      660
aatttgactc ccagttcaca ggcctgagga ngnatcnccc gaaatcctta ttgcg      715

```

```

<210> 214
<211> 345
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(345)
<223> n = A,T,C or G

```

```

<400> 214
ggtaangngc atacntcggg gctccggccg ccggagtcgg gggattcggg tgatgcctcc      60
tcaggcccac ttgggcctgc ttttcccaaa tggcagctcc tctggacatg ccattccttc      120
tcccacctgc ctgattcttc atatgttggg tgtccctggt tttctggtgc tatttcctga      180
ctgctgttca gctgccactg tcttgcaaag cctgcctttt taaatgcctc accattcctt      240
catttgtttc ttaaatatgg gaagtgaag tgccacctga ggccggggcac agtggctcac      300
gcctgtaatc ccagcacttt gggagcctga ggaggcatca cccga      345

```

```

<210> 215
<211> 429
<212> DNA
<213> Homo sapien

```

```

<400> 215
ggtgatgcct cctcaggcga agctcaggga ggacagaaac ctcccgtgga gcagaagggc      60
aaaagctcgc ttgatcttga ttttcagtac gaatacagac cgtgaaagcg gggcctcacg      120
atccttctga ccttttgggt ttttaagcagg aggtgtcaga aaagttacca cagggataac      180
tggcttgtgg cggccaagcg ttcatagcga cgctcgcttt tgatccttcg atgtcggctc      240
ttcctatcat tgtgaagcag aattcaccaa gcgttggatt gtccaccac taatagggaa      300
cgtgagctgg gtttagaccg tcgtgagaca ggtagtttt accctactga tgatgtgkkg      360
ttgccatggg aatcctgctc agtacgagag gaaccgcagg ttcasacatt tgggtgatgt      420
gcttgccctt

```

```

<210> 216
<211> 593
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(593)

```

<223> n = A,T,C or G

<400> 216

tgacacctat	gtccngcatc	tgttcacagt	ttccacaaat	agccagcctt	tggccacctc	60
tctgtcctga	ggtatacaag	tatatacagga	ggtgtatacc	ttctcttctc	ttccccacca	120
aagagaacat	gcaggctctg	gaagctgtct	taggagcctt	tgggctcaga	atttcagagt	180
cttgggtacc	ttggatgtgg	tctggaagga	gaaacattgg	ctctggataa	ggagtacagc	240
cggaggaggg	tcacagagcc	ctcagctcaa	gcccctgtgc	cttagtctaa	aagcagcttt	300
ggatgaggaa	gcagggttaag	taacatacgt	aagcgtacac	aggtagaaag	tgctgggagt	360
cagaattgca	cagtgtgtag	gagtagtacc	tcaatcaatg	agggcaaata	aactgaaaga	420
agaagaccna	ttaatgaatt	gcttangggg	aaggatcaag	gctatcatgg	agatctttct	480
aggaagatta	ttgtttanaa	ttatgaaagg	antagggcag	ggacagggcc	agaagtanaa	540
ganaacattg	cctatanccc	ttgtcttgca	cccagatgct	ggacaagggtg	tca	593

<210> 217

<211> 335

<212> DNA

<213> Homo sapien

<400> 217

tgacaccttg	tccagcatct	gacgtgaaga	tgagcagctc	agaggaggtg	tcctggattt	60
cctggttctg	tgggctccgt	ggcaatgaat	tcttctgtga	agtggatgaa	gactacatcc	120
aggacaaatt	taatcttact	ggactcaatg	agcagggtccc	tcactatcga	caagctctag	180
acatgatctt	ggacctggag	cctgatgaag	aactggaaga	caaccccaac	cagagtgacc	240
tgattgagca	ggcagccgag	atgctttatg	gattgatcca	cgcccgctac	atccttacca	300
accgtggcat	cgcccagatg	ctggacaagg	tgtca			335

<210> 218

<211> 248

<212> DNA

<213> Homo sapien

<400> 218

tacgtactgg	tcttgaaggt	cttaggtaga	gaaaaaatgt	gaatatttaa	tcaaagacta	60
tgtatgaaat	gggactgtaa	gtacagaggg	aagggtggcc	cttatcgcca	gaagtggta	120
gatgcgtccc	cgtcagtaaa	tggtgtgtca	ctgcccagaca	tttgccgaat	tactgaaatt	180
ccgtagaatt	agtgcaaatt	ctaacgttgt	tcactctaaga	ttatgggtcc	atgtttctag	240
tactttta						248

<210> 219

<211> 530

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(530)

<223> n = A,T,C or G

<400> 219

tgacgcttgg	ccacttgaca	caagtagggg	ataaggacaa	agacccatna	ggtggcctgt	60
cagccttttg	ttactgttgc	ttccctgtca	ccacggcccc	ctctgtaggg	gtgtgctgtg	120
ctctgtggac	attggtgcat	tttcacacat	accattctct	ttctgcttca	cagcagtcct	180
gaggcgggag	cacacaggac	taccttgtca	gatgangata	atgatgtctg	gccaactcac	240
ccccaaacct	tctcactagt	tatangaaga	gccangccta	naaccttcta	tcctgncccc	300

ttgcacctatg	acctcatccc	tgttccatgc	cctattctga	tttctggtga	actttggagc	360
agcctgggtt	ntcctcctca	ctccagcctc	tctccatacc	atgggtanggg	ggtgctgttc	420
cacncaaang	gtcaggtgtg	tctggggaat	cctnananct	gccnggagtt	tcenangcat	480
tcttaaaaac	cttcttgctt	aatcanatng	tgtccagtg	ccaacntcn		530

<210> 220

<211> 531

<212> DNA

<213> Homo sapien

<400> 220

tgacgcttg	ccacttgaca	ctaaatagca	tcttctaaag	gcctgattca	gagttgtgga	60
aaattctccc	agtgtcaggg	attgtcagga	acagggctgc	tcctgtgctc	actttacctg	120
ctgtgtttct	gctggaaaag	gagggagag	gaatggctga	tttttaccta	atgtctccca	180
gtttttcata	ttcttcttg	atcctcttct	ctgacaactg	ttcccttttg	gtcttcttct	240
tcttgctcag	agagcaggtc	tctttaaaac	tgagaagggg	gaatgagcaa	atgattaaag	300
aaaacacact	tctgaggccc	agagatcaaa	tattaggtaa	atactaaacc	gcttgctgct	360
tgtggctact	tttctcctct	ttcacatgct	ctatccctct	atccccacc	tattcatatg	420
gcttttatct	gccaaagttat	ccggcctctc	atcaaccttc	tcccctagcc	tactggggga	480
tatccatctg	ggtctgtctc	tggtgtattg	gtgtcaagtg	gccaaagcgtc	a	531

<210> 221

<211> 530

<212> DNA

<213> Homo sapien

<400> 221

attgacgctt	ggccacttga	cacccgcctg	cctgcaatac	tggggcaagg	gccttcactg	60
ctttcctgcc	accagctgcc	actgcacaca	gagatcagaa	atgctaccaa	ccaagactgt	120
tggtcctcag	cctctctgag	gagaaagagc	agaagcctgg	aagtcagaag	agaagctaga	180
tcggctacgg	ccttggcagc	cagcttcccc	acctgtggca	ataaagtcgt	gcattggctta	240
acaatggggg	cacctcctga	gaaacacatt	gttaggcaat	tcggcggtgt	ttcatcagag	300
catatttaca	caaacctcga	tagtgagccc	tactatccac	tattgctcct	acgctgcaaa	360
cctgaacagc	atgggactgt	actgaatact	ggaagcagct	ggtgatggta	cttatttgtg	420
tatctaaaca	cagagaaggt	acagtaagaa	tatggtatca	taaacttaca	gggaccgcca	480
tcctatatgc	agtctgttgt	gaccaaatag	tgtcaagtgg	ccaagcgtca		530

<210> 222

<211> 578

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (578)

<223> n = A, T, C or G

<400> 222

tgtatcgacg	tagtgggtctc	cgggctacta	ggccggtgtg	tgctggtagt	acctggttca	60
ctgaaaggcg	catctccctc	cccgcgtcgc	cctgaagcag	ggggaggact	tcgcccagcc	120
aaggcagttg	tatgagtttt	agctgcggca	cttcgagacc	tctgagccca	cctccttcag	180
gagccttccc	cgattaagga	agccagggtg	aggattcctt	cctccccccag	acaccacgaa	240
caaaccacca	ccccccctat	tctggcagcc	catatacatc	agaacgaaac	aaaaataaca	300
aataaacnaa	aaccaaataa	aaaagagaag	gggaaatgta	tatgtctgtc	catcctgttg	360
ctttagcctg	tcagctccta	nagggcaggg	accgtgtcct	ccgaatggtc	tgtgcagcgc	420

cgactgcggg	aagtatcgga	ggaggaagca	gagtcagcag	aagttgaacg	gtgggcccgg	480
cggctcttgg	gggctgggtg	tgtacttcga	gaccgctttc	gctttttgtc	ttagatttac	540
gtttgctctt	tggagtggga	naccactacn	tcnatata			578

<210> 223

<211> 578

<212> DNA

<213> Homo sapien

<400> 223

tgtatcgacg	tagtgggtctc	ctcttgcaaa	ggactgggtg	gtgaatgggt	tccctgaatt	60
atggacttac	cctaaacata	tcttatcatc	attaccagtt	gcaaaatatt	agaatgtggt	120
gtcactgttt	catttgattc	ctagaagggt	agtcttagat	atgttacttt	aacctgtatg	180
ctgtagtgct	ttgaatgcat	tttttgtttg	cattttttgt	tgcccaacct	gtcaattata	240
gctgcttagg	tctggactgt	cctggataaa	gctgttaaaa	tattcaccag	tccagccatc	300
ttacaagcta	attaagtcaa	ctaaatgctt	ccttgttttg	ccagacttgt	tatgtcaatc	360
ctcaatttct	gggttcattt	tgggtgccct	aaatcttagg	gtgtgacttt	cttagcatcc	420
tgtaacatcc	attcccaagc	aagcacaact	tcacataata	ctttccagaa	gttcattgct	480
gaagcctttc	cttcacccag	cggagcaact	tgattttcta	caacttcctc	catcagagcc	540
acaagagtat	gggatatgga	gaccactacg	tcgataca			578

<210> 224

<211> 345

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (345)

<223> n = A,T,C or G

<400> 224

tgtatcgacg	tantgggtctc	ccaagggtgct	gggattgcag	gcatgagcca	ccactcccag	60
gtggatcttt	ttctttatac	ttacttcatt	aggtttctgt	tattcaagaa	gtgtagtggt	120
aaaagtcttt	tcaatctaca	tggttaaata	atgatagcct	gggaaataaa	tagaaatttt	180
ttctttcatc	tttaggttga	ataaagaaac	agaaaaaata	gaacatactg	aaaataatct	240
aagttccaac	catagaagaa	ctgcagaaga	aatgaagaaa	gtgatgatga	tttagatttt	300
gatattgatt	tagaagacac	aggaggagac	cactacgtcg	atata		345

<210> 225

<211> 347

<212> DNA

<213> Homo sapien

<400> 225

tgtatcgacg	tagtgggtctc	caaactgagg	tatgtgtgcc	actagcacac	aaagccttcc	60
aacagggacg	caggcacagg	cagtttaaa	ggaatctggt	tctaaattaa	tttccacctt	120
ctctaagtat	tctttcctaa	aactgatcaa	ggtgtgaagc	ctgtgctctt	tcccaactcc	180
cctttgacaa	cagccttcaa	ctaacacaag	aaaaggcatg	tctgacactc	ttcctgagtc	240
tgactctgat	acgttggtct	gatgtctaaa	gagctccaga	acaccaaagg	gacaattcag	300
aatgctgggtg	tataacagac	tccaatggag	accactacgt	cgataca		347

<210> 226

<211> 281

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (281)

<223> n = A,T,C or G

<400> 226

aggngnggga	ntgtatcgac	gtagtgggtct	cccaacagtc	tgtcattcag	tctgcaggtg	60
tcagtgtttt	ggacaatgag	gcaccattgt	cacttattga	ctcctcagct	ctaaatgctg	120
aaattaaatc	ttgtcatgac	aagtctggaa	ttcctgatga	ggttttacaa	agtattttgg	180
atcaatactc	caacaaatca	gaaagccaga	aagaggatcc	tttcaatatt	gcagaaccac	240
gagtggattt	acacacctca	ggagaccact	acgtcgatac	a		281

<210> 227

<211> 3646

<212> DNA

<213> Homo sapien

<400> 227

gggaaacact	tcctccagc	cttgtaaggg	ttggagccct	ctccagtata	tgctgcagaa	60
tttttctctc	ggtttctcag	aggattatgg	agtccgcctt	aaaaaaggca	agctctggac	120
actctgcaaa	gtagaatggc	caaagtttgg	agttgagtgg	ccccttgaag	ggctactgaa	180
cctcacaatt	gttcaagctg	tgtggcgggt	tgttactgaa	actcccggcc	tccttgatca	240
gtttccctac	attgatcaat	ggctgagttt	ggtcaggagc	acccttcccg	tggtccact	300
catgcaccat	tcataatttt	acctccaagg	tcctcctgag	ccagaccgtg	ttttcgctc	360
gaccctcagc	cggttcggct	cgccctgtac	tgctctctct	tgaagaagag	gagagtctcc	420
ctcaccagct	cccaccgcct	taaaaccagc	ctactccctt	agggtcaccc	catgtctcct	480
cggctatgtc	ccctgtaggc	tcatcaccca	ttgcctcttg	ggtgcaaccg	tggtgggagg	540
aagtagcccc	tctactacca	ctgagagagg	cacaagtccc	tctgggtgat	gagtgtcca	600
cccccttctc	ggtttatgtc	ccttctttct	acttctgact	tgtataattg	gaaaacccat	660
aatcctccct	tctctgaaaa	gccccaggct	ttgacctcac	tgatggagtc	tgtactctgg	720
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cccccttacc	cttcagcaac	caccaccctg	atcagtcagc	agccatcagc	accgaggcaa	3540
ggccctccac	gcacaaaaag	attctgactc	actgaagact	tggatgatca	ttagtatattt	3600
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<210> 228

<211> 419

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (419)

<223> n = A,T,C or G

<400> 228

taagagggtg	caagatctaa	gcacagccgt	caatgcagaa	cacagaacgt	agcctggtaa	60
gtgtgttaag	agtgggaatt	tttgagtagc	agagtaaggc	acctaaccct	agctgggggtt	120
tggtgacggg	cccagatggc	ttacagaaga	aagtgtcctg	agatgagttt	ttaagaatga	180
ataaggatag	acacaagtga	ggactgactt	ggcagtgggtg	aatgggtgggt	ggcaaaaaac	240
ttcgcatgta	tggaaaactgc	acgtacagga	atgaagaatg	agactgtgtg	gtgtttaatg	300
agctgcaaat	actaatttta	tctgaaagt	tttgaagagt	taactaaaaa	gtatttttta	360
gtaaggaaat	aaccctacat	ttcagggtta	ttgtttgttt	anatattgaa	ggtgcccaa	419

<210> 229

<211> 148

<212> DNA

<213> Homo sapien

<400> 229

aagagggtac	ctgtatgtag	ccatgggtggc	aatgagagac	tgattactac	ctgctggaga	60
ttgtttaagt	gagttaatat	attaaggata	aaggagagcca	ggttttttga	ctgttgagaga	120
aggaaattac	agatattgaa	ggtcccaa				148

<210> 230
 <211> 257
 <212> DNA
 <213> Homo sapien

<400> 230
 taagagggtta cmaaaaaaaaa aaaatagaac gaatgagtaa gacctactat ttgatagtac 60
 aacagggtga ctatagtcaa tgataactta attatacatt taacatagag tgtaattgga 120
 ttgtttgtaa ctccaaggat aaatgcttga gaggatggat accccattct ccatgatgta 180
 cttatttcac attacatgcc tgtatcaaag catctcatat accctataaa tatgtacacc 240
 tactatgtac cctctta 257

<210> 231
 <211> 260
 <212> DNA
 <213> Homo sapien

<400> 231
 taagagggtta cgggtatttg ctgatgggat ttttttttct ttctttttct ttggaaaaca 60
 aaatgaaagc cagaacaaaa ttattgaaca aaagacaggg actaaatctg gagaaatgaa 120
 gtcccctcac ctgactgcca tttcattcta tctgaccttc cagtctaggt taggagaata 180
 gggggtggag gggattaatc tgatacaggt atatttaaag caactctgca tgtgtgccag 240
 aagtccatgg taccctctta 260

<210> 232
 <211> 596
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(596)
 <223> n = A,T,C or G

<400> 232
 tgctcctctt gccttaccaa ccacaaatta gaaccataat gagatgtcac ctcatacctg 60
 gtgggattaa cattatttaa aaaatcagaa gtattgacaa ggatgtgaag aaattagaac 120
 atctgtgcac tgttggtggg aatgtaaaaa aggtgtggcc actatgggta acagcatgaa 180
 ggttcctcaa aaaaaatttt ttttaattcta ctctatgatc gatcttgagg ttgtttatgc 240
 aaaagaactg aaatcaggat tttgaggaaa tattcacatt cccacatcca tttctgcttt 300
 attcataata ctcaagagat ggaaacaacc taaatgtcca tcccgggatg aatggataaa 360
 cacagtgtgg tatatgcata caatggaata ttatttagtc tttaaaaaga aaaattctat 420
 catatactac aacttanatn aaccttgagg acacaatgct nagtgaaata agccacggaa 480
 ggacgaatac tgcattattc ctttatatga agtatctaaa gtgggtcaaac tcttanagca 540
 naaagtaaaa atgggtggtt gccanacagt tggtaggcn agaaganaan cctant 596

<210> 233
 <211> 96
 <212> DNA
 <213> Homo sapien

<400> 233
 tcttctgaag acctttcgcg actcttaagc tctgggttgg taaggcaaga ggagcgttgg 60
 taaggcaaga ggagcgttgg taaggcaaga ggagca 96

<210> 234
 <211> 313
 <212> DNA
 <213> Homo sapien

<400> 234
 tgtaagtcga gcagtgatgataaaaactt gaatggatca atagttgctt cttatggatg 60
 agcaaagaaa gtagtttctt gtgatggaat ctgctcctgg caaaaatgct gtgaacgttg 120
 ttgaaaagac aacaaagagt ttagagtagt acataaattt agaatagtac ataaacttag 180
 aatagtagat aaacttagta cataaataat gcacgaagca ggggcagggc ttgagagaat 240
 tgacttcaat ttggaaagag tatctactgt aggttagatg ctctcaaaca gcatcacact 300
 gctcgactta caa 313

<210> 235
 <211> 550
 <212> DNA
 <213> Homo sapien

<400> 235
 aacgaggaca gatccttaaa aagaatgttg agtgaaaaaa gtagaaaata agataatctc 60
 caaagtccag tagcattatt taaacatttt taaaaaatac actgataaaa attttgtaca 120
 tttcccaaaa atacatatgg aagcacagca gcatgaatgc ctatgggrtt gaggataggg 180
 gttgggagta gggatgggga taaaggggga aaataaaaacc agagaggagt cttacacatt 240
 tcatgaacca aggagtataa ttatttcaac tatttgtacc wgaagtccag aaagagtgga 300
 ggcagaaggg ggagaagagg gcgaagaaac gtttttggga gaggggtccc asaagagaga 360
 ttttcgcat gtggcgctac atacgttttt ccaggatgcc ttaagctctg caccctattt 420
 ttctcatcac taatattaga ttaaaccctt tgaagacagc gtctgtggtt tctctacttc 480
 agctttccct ccgtgtcttg cacacagtag ctgttttaca agggttgaac tgactgaagt 540
 gagattattc 550

<210> 236
 <211> 325
 <212> DNA
 <213> Homo sapien

<400> 236
 tagactgact catgtcccct accagagtag ctagaattaa tagcacaagc ctctacaccc 60
 aggaactcac tattgaatac ataaatggaa tttattcagc cttaaaaagt ttggaaggaa 120
 attctgacat atgctaaaac atggatgaac cttgaagact ttatgataag taaaagaagc 180
 cagtcataaa aggaaaaata ttgcatgatt ccacttatat gaggtaccta gtagtagtcaa 240
 tttcatagaa acacaaaata gaatggtgtt tgccagggtt tttgaggaaa agggatgac 300
 aagttagggg acatgagtca gtcta 325

<210> 237
 <211> 373
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (373)
 <223> n = A, T, C or G

<400> 237

tagactgact	catgtcccct	atctactcaa	catttccact	tgaagtctga	taggcatctc	60
agacttatct	tgtcccaaag	caaactcttt	atttcttttc	atcctagtct	ttatttcttg	120
tgctgtctta	cccattctca	aagagtgcc	aaatccacca	agttgctgaa	acagaaatct	180
aagaaatatt	cttgattctt	ctttttccca	tctacttcac	ttctaattca	ttagtaaata	240
atctgtttca	gaaaaccaa	cacctcatgt	tctcactcat	aagggggagt	tgaacaatga	300
gaacacacag	acacagggag	gggaacatca	cacaccacgg	cccgtcaggg	agtangggac	360
atgagtcagt	cta					373

<210> 238

<211> 492

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (492)

<223> n = A,T,C or G

<400> 238

tagactgact	catgtcccct	ataatgctcc	caggcatcag	aaagcatctc	aaactggagc	60
tgacaccatg	gcagagggtt	caggtaagtc	acaaaagggg	tcctaaagaa	tttgcctca	120
atatcagagt	gattagaaga	agtggacaga	gctacccaag	ttaaacatat	gcgagataaa	180
aaaaatatgg	cacttgtgaa	cacacactac	aggaggaaaa	taaggaacat	aatagcatat	240
tgtgctatta	tgatgatgaa	gaacctctct	anaagaaaac	ataaccaaaag	aaacaaagaa	300
aattcctgcn	aatgtttaat	gctatagaag	aaattaacaa	aaacatatat	tcaatgaatt	360
cagaaaagtt	agcagggtcan	aagaaaacaa	atcaaagacc	agaataatcc	catttttagat	420
tgtcgagtaa	actanaacag	aaagaatacc	actggaaatt	gaattcctac	gtangggaca	480
tgantcantc	ta					492

<210> 239

<211> 482

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (482)

<223> n = A,T,C or G

<400> 239

tggaagat	ttaatgatgg	gcaacttgct	gtttaacttcc	tacatatccc	atcatcttct	60
gtattttttt	aaataacttt	tttttggtt	tttaaagtaa	ccttattctg	agaggtaaca	120
tggtattacat	acttctaagc	cattaggaga	ctctatgtta	aaccaaaagg	aaatgttact	180
agatcttcat	ttgatcaata	ggatgtgata	atcatcatct	ttctgctcta	atggaaaagt	240
actanaaaca	tggaaccata	atcttagatg	aacaacgtta	gaatttgcac	taattctacg	300
gaatttcagt	aattcgga	atgtcgggca	gtgacacaac	atttcatgac	ggggacgcat	360
ctaccaactt	ctggcgataa	gggccaccct	tcctctgtga	cttacagtcc	catttcatac	420
acagtctttg	attaaatatt	cacatttttt	ctctacctaa	agaccttcaa	gaccagtacg	480
ta						482

<210> 240

<211> 519

<212> DNA

<213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(519)
 <223> n = A,T,C or G

<400> 240

tgtatcgacg	tagtgggtctc	cccatgtgat	agtctgaaat	atagcctcat	gggatgagag	60
gctgtgcccc	agcccgacac	ccgtaaagg	tctgtgctga	ggtggattag	taaaagagga	120
aagccttgca	gttgagatag	aggaaggga	ctgtctcctg	cctgcccctg	ggaactgaat	180
gtctcgggtat	aaaacccgat	tgtacatttg	ttcaattctg	agataggaga	aaaaccaccc	240
tatggcgagg	ggcgagacat	gttggcagca	atgctgcctt	gttatgcttt	actccacaga	300
tgtttgggcg	gagggaaca	taaattctgg	ctacgtgcac	atccaggcat	agtacctccc	360
tttgaactta	attatgacac	agattccttt	gtccacatgt	ttttttgctg	accttctcct	420
tattatcacc	ctgctctcct	accgcattcc	ttgtgctgag	ataatgaaaa	taatataaat	480
aaaaacttga	nggaactcgg	agaccactac	gtcgataca			519

<210> 241
 <211> 771
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(771)
 <223> n = A,T,C or G

<400> 241

tgtatcgacg	tagtgggtctc	cactcccgcc	ttgacggggc	tgctatctgc	cttccaggcc	60
actgtcacgg	ctcccgggta	gaagtcactt	atgagacaca	ccagtgtggc	cttgttggct	120
tgaagctcct	cagaggagg	tggaacaga	gtgaccgagg	gggcagcctt	gggctgacct	180
aggacgggtca	gcttgggtccc	tccgccaac	acgagagtgc	tgctgcttgt	atatgagctg	240
cagtaataat	cagcctcgtc	ctcagcctgg	agcccagaga	tggtcaggga	ggcctgtgtg	300
ccanacttgg	agccagagaa	gcgattagaa	acccctgagg	gccgattacc	gacctcataa	360
atcatgaatt	tgggggcttt	gcctgggtgc	tgctgggtacc	angagacatt	attataacca	420
ccaacgtcac	tgctgggtcc	antgcaggga	aaatggttga	tcnaactgtc	caagaaaacc	480
actacgtcca	taccaatcca	ctaattgcn	gccgcctgca	ggttcaacca	tattggggaa	540
naactcccn	ccgcctgttg	ggattgncat	naacctttga	aattttttcc	tattanttgt	600
ccccctaaaa	taaacnnttg	ggcnttaatc	cattgggtcc	atancttntt	tncccggttt	660
ttaaaanttg	tttatcccg	cncnctnntt	cccccccaac	tttccaaaac	ccgaaacct	720
tnaaattnt	tnaaacctg	gggggttccc	nnaattnnan	tnaanctnc	c	771

<210> 242
 <211> 167
 <212> DNA
 <213> Homo sapien

<400> 242

tgggcacctt	caatatcg	ctcatcgata	acatcacgct	gctgatgctg	ctgttgctgg	60
tcctctctag	gaacctctg	atcttcaa	ttcttgagga	attcatccaa	attatctgcc	120
tctctctcct	tctctctttt	tctaaggtct	tctgggtaca	gcgggtca		167

<210> 243
 <211> 338
 <212> DNA
 <213> Homo sapien

<400> 243

ttggggcacct	tcaatatcta	ctgatctaaa	tagtgtgggt	tgaggcctct	tgttcctggc	60
taaaaatcct	tggcaagagt	caatctccac	tttacaatag	aggtaaaaaat	cttacaatgg	120
atattcttga	caaagctagc	atagagacag	caattttaca	caagggtattt	ttcacctgtt	180
taataacagt	ggttttctta	cacccatagg	gtgccaccaa	gggaggagt	cacagttgca	240
gaaacaaatt	aagatactga	agacaacact	acttaccatt	tcccgtatag	ctaaccacca	300
gttcaactgt	acatgtatgt	tcttatgggc	aatcaaga			338

<210> 244

<211> 346

<212> DNA

<213> Homo sapien

<400> 244

tttttggtc	ccatacagca	cactctcatg	ggaaatgtct	gttctaaggt	caaccataa	60
tgcaaaaatc	atcaatatac	ttgaagatcc	ccgtgtaagg	tacaatgtat	ttaatatatt	120
cactgataca	attgatccaa	taccagtttt	agtctggcat	tgaatcaa	cactgttttt	180
gttgataaaa	aagagaaata	tttagcttat	atttaagtac	catattgtaa	gaaaaaagat	240
gcttatcttt	acatgctaaa	atcatgatct	gtacattggt	gcagtgaata	ttactgtaaa	300
agggaagaag	gaatgaagac	gagctaagga	tattgaaggt	gcccaa		346

<210> 245

<211> 521

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (521)

<223> n = A,T,C or G

<400> 245

accaatccca	cacggatact	gagggacaag	tatatcatcc	catttcatcc	ctacagcagc	60
aacttcatga	ggcaggagtt	attagtccca	ttttacagaa	gaggaaactg	agacttaggg	120
agatcaagta	atttgcccag	gtcgcacaat	tagtgataga	gccagggtt	gaagcgacgt	180
ctgtcttaag	ccaatgaccc	ctgcagatta	ttagagcaac	tggtctccac	aacagtgtaa	240
gcctcttgct	anaagctcag	gtccacaagg	gcagagattt	ttgtctgttt	tgctcattgc	300
tccttcccca	ttgcttagag	cagggtctgc	cacgaancag	gttctcaatg	catagttatt	360
aaatgtatat	aagagcaaac	atatgttaca	gagaactttc	tgtatgcttg	tcacttacat	420
gaatcacctg	tganatgggt	atgcttggtc	cccantgttg	cagatnaaga	tattgaangt	480
gcccaaatca	ctanttgcgg	gcgcctgcan	gtccancata	t		521

<210> 246

<211> 482

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (482)

<223> n = A,T,C or G

<400> 246

tggaaccaat	ccaaatacco	atcaatgata	gactggataa	agaaaatttg	gcacatgttc	60
------------	------------	------------	------------	------------	------------	----

accatgaaat	actatgcagc	cataaaaaag	gatgagttca	tatcctttgc	agggacatgg	120
atgaagctgg	agaccatcat	tctcagcaaa	ctaacaaggg	aacagaaaac	caaacactgc	180
atgtttctcac	tcttaagtgg	gagctgaaca	atgagaacac	atggacacag	ggaggggaac	240
atcacacagt	ggggcctgct	ggtgggtagg	ggtctagggg	agggatagca	ttaggagaaa	300
tacctaattgt	agatgacggg	ttgatgggtg	cagcaaacca	ccatgacacg	tgtataccta	360
tgtaacaaac	ctgcatgttc	tgccacatgta	ccccagaact	taaagtgtta	ataaaaaaat	420
taagaaaaaa	gttaagtatg	tcatagatac	ataaaatatt	gtanatattg	aaggtgccca	480
aa						482

<210> 247

<211> 474

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(474)

<223> n = A,T,C or G

<400> 247

ttcgatacag	gcacagagta	agcagaaaaa	tggtctgtgg	ttaaccaagt	gagtacagtt	60
aagtgagaga	ggggcagaga	agacaagggc	atatgcaggg	ggtgattata	acaggtggtt	120
gtgctgggaa	gtgagggtac	tccgggatga	ggaacagtga	aaaagtggca	aaaagtggta	180
agatcagtga	attgtacttc	tccagaattt	gatttctggg	ggagtcaa	aactatccag	240
tttggggtat	catanggcaa	cagttgaggt	ataggaggta	gaagtcncag	tgggataatt	300
gaggttatga	anggtttgg	actgactggt	actgacaang	tctgggttat	gaccatggga	360
atgaatgact	gtanaagcgt	anaggatgaa	actattccac	ganaaaaggg	tccnaaaact	420
aaaaannnaa	gnnnnnnggg	aattattatt	atgtggatat	tgaangtgcc	caaa	474

<210> 248

<211> 355

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(355)

<223> n = A,T,C or G

<400> 248

ttcgatacag	gcaaacatga	actgcaggag	ggtgggtgac	atcatgatgt	tgccgatggt	60
ccggatggnc	acgaagacgc	actggancac	gtgcttacgt	ccttttgctc	tggtgatggc	120
cctgagggga	cgcaggaccc	ttatgaccct	cagaatcttc	acaacgggag	atggcactgg	180
attgantccc	antgacacca	gagacacccc	aaccaccagn	atatcantat	attgatgtag	240
ttcctgtaga	nggccccctt	gtggaggaaa	gctccatnag	ttggtcatct	tcaacaggat	300
ctcaacagtt	tccgatggct	gtgatgggca	tagtcatant	taacctgtgn	tcgaa	355

<210> 249

<211> 434

<212> DNA

<213> Homo sapien

<400> 249

ttggattggg	cctccaggag	aacaagggga	aaaaggtgac	cgagggctcc	ctggaactca	60
aggatctcca	ggagcaaaa	gggatggggg	aattcctggg	cctgctgggc	ccttaggtcc	120

acctggctect	ccaggcttac	caggtcctca	aggcccaaag	ggtaacaaag	gctctactgg	180
acccgctggc	cagaaagggtg	acagtgggtct	tccagggcct	cctgggcctc	caggtccacc	240
tgggtgaagtc	attcagcctt	taccaatctt	gtcctccaaa	aaaacgagaa	gacatactga	300
aggcatgcaa	gcagatgcag	atgataatat	tcttgattac	tcggatggaa	tggaagaaat	360
atttggttcc	ctcaattccc	tgaaacaaga	catcgagcat	atgaaatttc	caatgggtac	420
tcagaccaat	ccaa					434

<210> 250
 <211> 430
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)... (430)
 <223> n = A,T,C or G

<400> 250	
tggattggctc	acatggcaga gacaggattc caaggcagtg agaggaggat acaatgcttc 60
tcactagtta	ttattattta ttttattttt gagatgaagt ctgcctttgt cttccaggct 120
ggagagcggg	ggtgcgatct tggctctctg caacccccgc ctcaagcaat tctcctgtct 180
tagcctcgcg	ggtagatgga attacaggcg cccaccgccca tgcccaacta atttttttgt 240
gtcttcagta	gagacagggt ttcgccatgt tgggcaggct ggtcttgaac tcctgacctc 300
nagtgatctg	ccctcctcgg cctcacaaag tgctggaatt acaggcatgg gctgctgcac 360
ccagtcaact	tctcactagt tatggcctta tcattttcac cacattctat tggcccaaaa 420
aaaaaaaaan	430

<210> 251
 <211> 329
 <212> DNA
 <213> Homo sapien

<400> 251		
tgggtactcca	ccatyatggg gtcaaccgcc atcctcgccc tctcctggc tgttctccaa 60	
ggagtctgtg	cagaggtgca gctgrtgag tctggagcag aggtgaaaaa gtccggggag 120	
tctctgaaga	tctcctgtaa ggggtctgga tacaccttta agatctactg gatcgcttg 180	
gtgcgccagt	tgcccggaag aggcctggag tggatggggc tcatctttcc tgatgactct 240	
gataccagat	acagcccgtc cttccaaggc caggtcacca tctcagtcga taagtccatc 300	
agcaccgcct	atctgcagtg gagtaccaa	329

<210> 252
 <211> 536
 <212> DNA
 <213> Homo sapien

<400> 252	
tgggtactcca	ctcagcccaa ccttaattaa gaattaagag ggaacctatt actattctcc 60
caggctcctc	tgtcttaacc aggtctctgg gacagtatta gaaaaggatg tctcaacaag 120
tatgtagatc	ctgtactggc ctaagaagtt aaactgagaa tagcataaat cagaccaaac 180
ttaatgggtcg	ttgagacttg tgcctcggag cagctgggat aggaaaactt ttgggcagca 240
agaggaagaa	ctgcctggaa gggggcatca tgttaaaaaa tacaagggga acccacacca 300
ggcccccttc	ccagctctca gcctagagta ttacatttc tcagctagag actcacaact 360
tccttgctta	gaatgtgccca ccggggggag tccctgtggg tgatgaggct ctcaagagtg 420
agagtggcat	cctatcttct gtgtgccac aggagcctgg cccgagactt agcaggtgaa 480
gtttctggtc	caggctttgc ccttgactca ctatgtgacc tctggtggag taccaa 536

<210> 253
<211> 507
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1) ... (507)
<223> n = A,T,C or G

<400> 253
ntgttgatgat cccagtaact cgggaagctg aggcggggagg atcacctgag ctcaggaggt 60
tgaggccgca gtgagccggg accacgccac tacactccag cctggggcat agagtgagac 120
cctccaagac agaaaagaaa agaaaggaag ggaaagggaa agggaaaagg aaaaggaaaa 180
ggaaaaggaa aaggaaaaga caagacaaaa caagacttga atttggatct cctgacttca 240
atthttatgtt cttttctacac cacaattcct ctgcttacta agatgataat ttagaaaccc 300
ctcgttccat tctttacagc aagctggaag tttggtcaag taattacaat aatagtaaca 360
aatttgaata ttatatgcca ggtgtttttc attcctgtct tcacttaatt ctcaccactc 420
tgatataaat acaattgctg ccgggtgtgg tggctcatgc ctgtaatccc ggcactttgg 480
gagaccgagg tgggcggats gcaacaa 507

<210> 254
<211> 222
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1) ... (222)
<223> n = A,T,C or G

<400> 254
ttggattggt cactgtgagg aagccaaatc ggatccgaga gtctttttct aaaggccagt 60
actggccaca cttttctcctg ccgccttcct caaagctgaa gacacacaga gcaaggcgct 120
tctgttttac tccccaatgg taactccaaa ccatagatgg ttagctnccc tgctcatctt 180
tccacatccc tgctattcag tatagtccgt ggaccaatcc aa 222

<210> 255
<211> 463
<212> DNA
<213> Homo sapien

<400> 255
tgttgcatc cataaatgct gaaatggaaa taaacaacat gatgagggag gattaagttg 60
gggagggagc acattaaggt ggccatgaag tttgttgga gaagtgactt ttgaacaagg 120
ccttggtgtt aagagctgat gagagtgtcc cagacagagg ggccactggt acaatagacg 180
agatgggaga gggcttgga ggtgtgcaaa ataggaagga gtttgttctg gtatgagtct 240
agtgaacaca gaggcgagag gccctggtgg gtgcagctgg agagttatgc agaataacat 300
taggcctgt gggggactgt agactgtcag caataatcca cagtttggat tttattctaa 360
gagtgatggg aagccgtgga aaggggggta agcaaggagt gaaattatca gatttacagt 420
gataaaaata aattggtctg gctactgggg aaaaaaaaaaaa aaa 463

<210> 256
<211> 262

<212> DNA

<213> Homo sapien

<400> 256

ttggattggt	caacctgctc	aactctacyt	ttctctcttc	ttcttaaaaa	attaatgaat	60
ccaatacatt	aatgccaaaa	cccttgggtt	ttatcaatat	ttctgttaaa	aagtattatc	120
cagaactgga	cataatacta	cataataata	cataacaacc	ccttcatctg	gatgcaaaca	180
tctattaata	tagcttaaga	tcactttcac	tttacagaag	caacatcctg	ttgatgttat	240
tttgatgttt	ggaccaatcc	aa				262

<210> 257

<211> 461

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (461)

<223> n = A,T,C or G

<400> 257

gnngnnnnnn	nnncaattcg	actcngttcc	cntggtancc	ggtcgacatg	gccgcgggat	60
taccgcttgt	nnctgggggt	gtatggggga	ctatgaccgc	ttgtagctgg	gggtgtatgg	120
gggactatga	ccgcttgtag	mtggkgtgt	atgggggact	atgaccgctt	gtcgggtggt	180
cggataaacc	gacgcaagg	acgtgatcga	agctgcgttc	ccgctctttc	gcatcggtag	240
ggatcatgga	cagcaatata	cgcattcgyc	tgaaggcggt	cgaccatcgc	gtgctcgatc	300
aggcgaccgg	cgacatcgcc	gacaccgcac	gccgtaccgg	cgcgctcatc	cgcggtccga	360
tcccgtttcc	cacgcgcata	gagaagttca	cggtcaaccg	tggcccgcac	gtcgacaaga	420
agtcgcgcga	gcagttcgag	gtgcgtacct	acaagcggtc	a		461

<210> 258

<211> 332

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (332)

<223> n = A,T,C or G

<400> 258

tgaccgcttg	tagctggggg	tgtatggggg	actacgaccg	cttgtagctg	ggggtgtatg	60
ggggactatg	accgcttgta	gctgggggtg	tatgggggac	tatgaccgct	tgtagctggg	120
ggtgtatggg	ggactaggac	cgcttgttag	tgggggtgta	tgggggacta	tgaccgcttg	180
tagctggggg	tgtatggggg	actacgaccg	cttgtagctg	ggggtgtatg	ggggactatg	240
accgcttgta	nctgggggtg	tatgggggac	tatgaccgct	tgtgctgcct	gggggatggg	300
aggagagttg	tgggtgggga	aaaaaaaaaa	aa			332

<210> 259

<211> 291

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (291)

<223> n = A,T,C or G

<400> 259

taccgcttgt	gaccgcttgt	gaccgcttgt	gaccgcttgt	gaccgcttgt	gaccgcttgt	60
gaccgcttgt	gaccgcttgt	gaccgcttgt	gaccgcttgt	gaccgcttgt	gaccgcttgt	120
gaccgcttgt	gaccgcttgt	nacngggggg	gtctggggga	ctatgannga	ntgtnactgg	180
gggtgtctgg	gggnctatga	nngantgtna	cnggggggtg	ctgggggact	atganngact	240
gtgcnnctg	ggggatcnga	ggagantngn	ggntagngat	ggttnnggan	a	291

<210> 260

<211> 238

<212> DNA

<213> Homo sapien

<400> 260

taagagggtta	ctgggttaaaa	tacaggaaat	ctggggtaat	gaggcagaga	accaggatac	60
tttgaggtca	gggatgaaaa	ctagaatttt	tttctttttt	tttgctgag	aaacttgctg	120
ctctgaagag	gccccatgtat	taattgcttt	gatcttcctt	ttcttacagc	cctttcaagg	180
gcagagccct	ccttatcctg	aaggaatctt	atccttagct	atagtatgta	ccctctta	238

<210> 261

<211> 746

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (746)

<223> n = A,T,C or G

<400> 261

ttgggcacct	tcaatatcaa	tagctaacat	ttattgagtg	tttatcgtat	cataaaacac	60
tgttctaagc	ctttaaacgt	actaattcat	ttaatgctca	taatcacttt	agaagggtggg	120
tactagtatt	agtctcattt	acagatgcaa	catgcaggca	cagagagggt	aattaacttg	180
cccaaggtaa	cacagctaa	aaatagaaaa	aatattgaat	ctggaaagtt	gggcttctgg	240
gtaaccacaca	gagtcttcaa	tgagcctggg	gcctcactca	gtttgctttt	acaaagcgaa	300
tgagtaacat	cacttaattc	agtgagtagg	ccaaatggag	gtcagctacg	agtttctgct	360
gttcttgcag	tggactgaca	gatgtttaca	acgtctggcc	atcagtwaat	ggactgatta	420
tcattgggaw	gtgggtgggc	tgaatgttgg	ccagtgaagt	ttattcawgc	catattttta	480
tgtttaggat	gacttttggc	tggtcctagg	gcaagctctg	tctgscacgg	aacacagaat	540
wacacagggg	ccccctcaat	ttctgggtgtg	gctagaacca	tgaaccactg	gttgggggaa	600
caagcgggtca	aaacctaa	gcggccggct	ggcagggtcc	acccatatgg	ggaaaactcc	660
cnacgcgttt	ggaatgcctn	agctngaatt	attctaanag	ttgtccnct	aaaattagcc	720
tgggcgttaa	tcangggctn	naagcc				746

<210> 262

<211> 588

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (588)

<223> n = A,T,C or G

<400> 262

tgaccgcttg	tcattctaca	tgggggtcctg	cacgcttttg	cctttttagg	aaacctgaca	60
tttgtctgtt	tcttctttct	cttttccttc	ccatatactc	ctaatttacg	tttgacttgt	120
ttgctgagga	ggcaggagct	agagactgct	gtgagctcat	aggggtggga	agtttatcct	180
tcaagtcccc	cccactcatc	actgcttctc	accttccccct	gaccaggctt	acaagtgggt	240
tcttgctgc	tttccctttg	gacccaacaa	gcccctgtaa	tgagtgtgca	tgactctgac	300
agctgtggac	tcagggtcct	tggctacagc	tgccatgtaa	aatatctcat	ccagttctcg	360
caaattgtta	aaataaccac	atttcttaga	ttccagtacc	caaatcatgt	ctttacgaac	420
tgctcctcac	acccagaagt	ggcacaataa	ttcttgggga	attattactt	ttttttttct	480
ctctnttnnc	gnnngnnnng	gnnngnccag	gaattaccac	nttggaagac	ctggccngaa	540
tttattatan	aggggagccg	attntttttc	ctaacacaaa	gcgggtca		588

<210> 263

<211> 730

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (730)

<223> n = A,T,C or G

<400> 263

tttttttttt	tttgccctga	gcaactgaaa	ttatgaaatt	tccatatact	caaaagagta	60
agactgcaaa	aagattaaat	gtaaaagttg	tcttggtatac	agtaatgttt	aagataccta	120
ttanatttat	aaatggaaaa	ttagggcatt	tggtatataca	agttgaaaat	tcaggagtga	180
ggttgggctg	gctgggtata	tactgaaaac	tgtcagtaca	cagatgacat	ctaaaaccac	240
aaatctgggt	ttatttttagc	agtgatatgt	gtcactccca	caaaagcctt	cccaattggc	300
ctcagcatat	acaacaagtc	acctccccac	agccctctac	acataaacia	attccttagt	360
ttagttcagg	aggaaatgcg	ccctttttcct	tccgctctag	gtgaccgcaa	ggcccagttc	420
tcgtcaccaa	gatgttaagg	gaagtctgcc	aaagaggcat	ctgaaaggaa	ataaggggaa	480
tgggagtgc	cacaaaggaa	agccaaggan	aaactttgga	gaccgtttct	aganccttgg	540
catttcacaa	caaaactcng	gaacaaacct	tgtctcatca	atcatttaag	cccttcgttt	600
ggannagact	ttctgaactg	ggcgctgaac	ataancctca	ttgaatgtct	tcacagtctc	660
ccagctgaag	gcacaccttg	ggccagaagg	ggaatcttcc	aggctctcaa	nacagggtct	720
gccctttgnc						730

<210> 264

<211> 715

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (715)

<223> n = A,T,C or G

<400> 264

tttttttttt	tttgccagct	atgatagtct	ctaccactat	attgaagctc	ttaggtcatt	60
tacacttaat	gtgggttatag	atgctgttga	gcttacttct	accaccttgc	tatttctccc	120
gtctcttttt	tgttcccttt	ctcttctttt	cctcccttat	tttataattg	aatttttttag	180
gattctattt	tattatagatt	tatcagctat	aacactttgt	attcttttgt	tttgtgggtc	240
ttctgtcatt	tcaatgtgca	tcttaaacct	atcacaaatc	attttcaa	aatatcatat	300
aaccttacat	ataatgtgaa	aatctaccac	catatatattc	catttctccc	ttccatccta	360

tgtnrtgcat	atTTTTTcct	ttatatatgt	tttaaagaca	taatagtata	tgaggaggtt	420
ttgcttaaaa	tgtgatcaat	attccttcaa	ngaaacgtaa	aaattcaaaa	taaatntctg	480
tttattctca	aatnnaccta	atatttccta	ccatntctna	tacntttcaa	gaatctgaag	540
gcattgggtt	tttccggctt	aagaacctcc	tctaaagcac	tctaagcaga	attaagtctt	600
ctgggagagg	aattctccca	agcttgggcc	ttnanntgta	ctccntnang	gttaaanttt	660
ggccgggaaa	tagaaattcc	aagttaacag	gntanttttt	ntttttnttn	tcncc	715

<210> 265
 <211> 152
 <212> DNA
 <213> Homo sapien

<400> 265						
tttttttttt	tttcccaaca	caaagcacca	ttatctttcc	tcacaatttt	caacatagtt	60
tgattcccat	gaagagggtta	tgattttctaa	agaaaacatg	gctactatac	tatcaatcag	120
ggttaaactct	tttttttttg	agacggaggt	ta			152

<210> 266
 <211> 193
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(193)
 <223> n = A,T,C or G

<400> 266						
taaactccgt	ccccttctta	atcaatatgg	aggctaccca	ctccacatta	ccttcttttc	60
aagggactgt	ttccgtaact	gttgtgggta	ttcacgacca	ggcttctaaa	cctcttaaaa	120
ctccccaatt	ctgggtgcaa	cttggacaac	atgctttttt	tttttttttt	tttttttttn	180
gagacggagt	tta					193

<210> 267
 <211> 460
 <212> DNA
 <213> Homo sapien

<400> 267						
tgttgcgatc	ccttaagcat	gggtgctatt	aaaaaaatgg	tgagagaagaa	aatacctgga	60
atttacgtct	tatctttaga	gattgggaag	accctgatgg	aggacgtgga	gaacagcttc	120
ttcttgaatg	tcaattccca	agtaacaaca	gtgtgtcagg	cacttgctaa	ggatcctaaa	180
ttgcagcaag	gctacaatgc	tatgggattc	tcccagggag	gccaatctct	gagggcagtg	240
gctcagagat	gcccttcacc	tcccatgac	aatctgatct	cggttggggg	acaacatcaa	300
gggtgtttttg	gactccctcg	atgccagga	gagagctctc	acatctgtga	cttcacccga	360
aaaacactga	atgctggggc	gtactccaaa	gttgttcagg	aacgcctcgt	gcaagccgaa	420
tactggcatg	accataaaaa	ggaggatgtg	gacgcgaaca			460

<210> 268
 <211> 533
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature

<222> (1)...(533)

<223> n = A,T,C or G

<400> 268

tgttgcgatc	cgttgataga	atagcgacgt	ggtaatgagt	gcatggcacg	cctccgactt	60
accttcgccc	gtggggaccc	cgagtaacgt	tacggcgctc	tcacttagag	taccctctgg	120
acgcccgggc	gcgttcgatt	taccggaagc	gcgagctgca	gtgggcttgc	gccccgggcc	180
aaattctttg	gggggtttta	ggcgcggggg	aatttgaggt	atctctatca	gtatgtagcc	240
aagttggaac	agtcgccatt	cccgaatcgc	ctttctttga	atccgcaccg	cctccagcat	300
tgcctcattc	atcaacctga	aggcacgcat	aagtgcggt	tgtgtcttca	gcagctccac	360
tccataacta	gcgcgctcga	cctcgtcttc	gtacgcgcca	ggtcgctgcg	tgcgaattcc	420
caactccggt	gagttgcgca	tttcaagttt	cgaaactgtt	cgctccacn	atttggcatg	480
ttcacgcatg	acacggaata	aactcgtcca	gtaccgggaa	tgggcatcgca	aca	533

<210> 269

<211> 50

<212> DNA

<213> Homo sapien

<400> 269

tttttttttt	ttcgctgaa	ttagctacag	atcctcctca	caagcggcca	50
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<210> 270

<211> 519

<212> DNA

<213> Homo sapien

<400> 270

tgttgcgatc	caaataaccc	accagcttct	tgcacacttc	gcagaagcca	ccgtcctttg	60
gctgagtcac	gtgaacgggc	agtgcaagca	gccgcgtgcc	agagcagagg	tgcagcatgc	120
tgcacaccag	ctcagggctg	acctcctcca	gcaggatgga	caggatggag	ctgccgtacg	180
tgtccaccac	ctcctggcac	tcttccgaca	gggacttcgg	cagcttcgag	cacattttgt	240
caaaagcgte	gagtatttct	ttctcagtct	tgttggtgtc	aatcagcttg	gtcacctcct	300
tcaccaggaa	ttcacacacc	tcacagtaaa	catcagactt	tgctgggacc	tcgtgcttct	360
taatgggctc	caccagttcc	agggcaggga	tgacattctt	ggaggccact	ttggcgggga	420
ccagagtctg	catgggcac	tctttcacct	catcacagaa	ccaaccagc	gcacagatct	480
ccttggggtg	catgtgcac	atcatctggg	atcgcaaca			519

<210> 271

<211> 457

<212> DNA

<213> Homo sapien

<400> 271

tttttttttt	ttcggggcgc	gaccggacgt	gcactcctcc	agtagcggct	gcacgtcgtg	60
ccaatggccc	gctatgagga	ggtgagcgtg	tccggcttcg	aggagttcca	ccgggcccgtg	120
gaacagcaca	atggcaagac	cattttcgcc	tactttacgg	gttctaagga	cgccgggggg	180
aaaagctggt	gccccgactg	cgtgcaggct	gaaccagtcg	tacgagaggg	gctgaagcac	240
attagtgaag	gatgtgtgtt	catctactgc	caagtaggag	aagagcctta	ttggaaagat	300
ccaaataatg	acttcagaaa	aaacttgaaa	gtaacagcag	tgctacact	acttaagtat	360
ggaacacctc	aaaaactggt	agaatctgag	tgtcttcagg	ccaacctggt	ggaaatggtg	420
ttctctgaag	attaagattt	taggatggca	atcaaga			457

<210> 272

<211> 102

<212> DNA
<213> Homo sapien

<400> 272

tttttttttt	ttgggcaaca	acctgaatac	cttttcaagg	ctctggcttg	ggctcaagcc	60
cgcaggggaa	atgcaactgg	ccaggtcaca	gggcaatcaa	ga		102

<210> 273
<211> 455
<212> DNA
<213> Homo sapien

<220>

<221> misc_feature
<222> (1)...(455)
<223> n = A,T,C or G

<400> 273

tttttttttt	ttggcaatca	acagggttaa	gtcttcggcc	gaagttaatc	tcgtgttttt	60
ggcaatcaac	aggtttaagt	cttcggccga	agttaatctc	gtgttttttg	caatcaacag	120
gtttaagtct	tcggccgaag	ttaatctcgt	gtttttggca	atcaacaggt	ttaagtcttc	180
ggccgaagtt	aatctcgtgt	ttttggcaat	caacagggtt	aagtcttcgg	ccgaagttaa	240
tctcgtgttt	ttggcaatca	acagggttaa	gtcttcggcc	gaagttaatc	tcgtgttttt	300
ggcaatcaag	aggtttaagt	cttcggccga	agttaatctc	gtgttttttg	caatcaacag	360
gtttaagtct	tcggccgaan	ttaatctcgt	gtttttggca	atcaacaggt	ttaantcttc	420
ggccgaagtt	aatctcgtgt	ttttggcaat	caana			455

<210> 274
<211> 461
<212> DNA
<213> Homo sapien

<400> 274

tttttttttt	ttggccaata	cccttgatga	acatcaatgt	gaaaatcctc	ggtaaaatac	60
tggcaaacca	aatccagcag	cacatcaaaa	agcttatcca	ccatgatcaa	gtgggcttca	120
tccttgggat	gcaaggctgg	ttcaacataa	gaaaatcaat	aaatgtaatc	catcacataa	180
acagaaccaa	agacaaaaac	cacatgatta	tttcaataga	tgcagaaaag	gccttggaac	240
aattcaacag	cccttcacgc	taaacactct	taataaacta	gatattgatg	gaatgtatct	300
caaaataata	agagctatct	atgacaaacc	cacagccaat	atcatactga	atgggcaaag	360
actggaagca	ttccctttga	aaactggcac	aagacaagga	tgccctctct	caccgctcct	420
attcaacata	gtattggaag	ttctggccag	ggcaatcaag	a		461

<210> 275
<211> 729
<212> DNA
<213> Homo sapien

<220>

<221> misc_feature
<222> (1)...(729)
<223> n = A,T,C or G

<400> 275

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catgaaaaca	taggaagggtg	gctgttacag	caaacatttc	agatagacga	atcggccaaag	120

ctccccaaac	cccaccttca	cagcctcttc	cacacgtctc	ccanagattg	ttgtccttca	180
cttgcaaatt	canggatgtt	ggaagtngac	atttnnagtn	gcnggaaccc	catcagttaa	240
ncantaagca	gaantaacgat	gactttgana	nacanctgat	gaagaacaen	ctacnganaa	300
ccctttctnt	cgtgttanga	tctcnngtcc	ntcactaatg	cggccccctg	cnggtccacc	360
atttgggaga	actccccccn	cgttggatcc	ccccttgagt	ntcccattct	ngtcccccan	420
accngncttg	ngngncantn	cnnccctenca	ccntgtttcc	ctgnngtnaa	aatnngtttt	480
nccgcncccc	naattcccac	ccnaatcaca	gcgaanccng	aaggccttcn	naagtgttta	540
angcccnng	gtttcctcnt	ntanttgacg	cctaccctcc	cncttnnnnt	tnogngttgg	600
tcgcgccttg	gnncgcctn	gttctctctt	nnggnnacia	cctngntcnn	nggcncntcn	660
nnctnttcc	tnnnactagc	tngcctntcc	ncnccngngn	ncanngcaca	ttncncnnac	720
tngttnncc						729

<210> 276
 <211> 339
 <212> DNA
 <213> Homo sapien

tgacctgaca	tgtagtagat	acttaataaa	tatttgtgga	atgaatggat	gaagtggagt	60
tacagagaaa	aatagaaaag	tacaaattgt	tgtcagtgtt	ttgaaggaaa	attatgatct	120
ttcccaaagt	tctgacttca	ttctaagaca	gggttagtat	ctccatacat	aattttactt	180
gcttttgaaa	atcaaagtga	ataatctatt	tagattgata	atttatttag	actggctata	240
aactattaag	tgctagcaaa	tatacatctt	aatctcattt	tccacctctt	gtgatatagc	300
tatgtagggt	ttgactttaa	tggtatgtcag	gtcaatccc			339

<210> 277
 <211> 664
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(664)
 <223> n = A,T,C or G

tgacctgaca	tccataacaa	aatctttctc	catttatatto	ttctagggga	atttcttgaa	60
aagcatccaa	aggaaacaaa	tgatggtaag	accgtgccaa	gtggggagca	gacaccaaag	120
taagaccaca	gattttacat	tcaacaggta	gtcacagta	ctttgcccga	cactgtgggc	180
agaaatagcc	tcctaatgta	agccctggct	cagtattgcc	atccaaatgc	gccatgctga	240
aagagggttt	tgcatcctgg	tcagatnaag	aagcaatggg	gtgctgagga	aatcccatac	300
gaataagtga	gcattcagaa	cttgagctag	caggaggagg	actaagatga	tgtgtgagca	360
actctttgta	atggctttca	tctaaaataa	catggtacgt	gccaccagtt	tcacgagcaa	420
gtacagtgca	aacgcgaact	tctgcagaca	atccaataac	agatactcta	atttttagctg	480
cctttagggt	cttgattaaa	tcataaatat	tagatggatc	gcaagttgta	aggntgctaa	540
aagatgatta	gtacttctcg	acttgtatgt	ccaggcatgt	tgttttaaan	tctgccttag	600
nccctgctta	ggggaatttt	taaagaagat	ggctctccat	gttcanggtc	aatcacnaat	660
tgcc						664

<210> 278
 <211> 452
 <212> DNA
 <213> Homo sapien

<220>

<221> misc_feature
<222> (1)...(452)
<223> n = A,T,C or G

<400> 278
tgacctgaca ttgaggaaga gcacacacct ctgaaattcc ttaggttcag aagggcattt 60
gacacagagt gggcctctga taattcatga aaagcattct gaagtcaccc agaattggagg 120
ctgcaatctg ctgtgctttg ggggttgcc cactgtgctc ctggatatca cacaaaagct 180
gcaatccttc ttcttcaact aacattttgc agtatttgct gggattttta ctgcagacat 240
gatacatagc ccatagtgcc cagagctgaa cctctggttg agagaagttg ccaaggagcg 300
ggaaaaatgt cttgaaagat ctataggtca ccaatgctgt catcttataa cttgaacttg 360
gccaatctg tatggttgca tgcagatctt ggagaagagt acgcctctgg aagtcacggg 420
atatccaaan ctgtctgtca gatgtcaggt ca 452

<210> 279
<211> 274
<212> DNA
<213> Homo sapien

<400> 279
tttttttttt ttcggaagg caaatctact tctgcaaaag ggtgctgctt gcacttttgg 60
ccactgagag agcacaccaa acaaagtagg gaaggggttt ttatccctaa cgcggttatt 120
ccctggttct gtgtcgtgtc cccattggct ggagtcagac tgcacaatct acactgaccc 180
aactggctac tgtttaaaat tgaatatgaa taattaggta ggaaggggga ggctgtttgt 240
tacggtacaa gacgtgtttg ggcattgtcag gtca 274

<210> 280
<211> 272
<212> DNA
<213> Homo sapien

<400> 280
tacctgacat ggagaaataa cttgtagtat tttgcgtgca atggaatact atatgagggt 60
gaaaatgaat gaactagcaa tgcgtgtatc aacatgaata aatccccaaa acataataat 120
gttgaatgga aaaggtgagt ttcagaagga tatatatgcc ctctaaatcc atttatgtaa 180
acctttaaaa aactacatta tttatggta taagtccatc cagaaaatat ttaaaaacct 240
acatgggatt gataactact gatgtcaggt ca 272

<210> 281
<211> 431
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(431)
<223> n = A,T,C or G

<400> 281
tttttttttt ttggccaata gcatgattta aacattggaa aaagtcaaat gagcaatgag 60
aatttttatg ttctcttgaa taatcaaaag agtaggcaac attgggtcct cattcttgaa 120
tagcattaat cagaaaatat tgcatagcct ctatgcctcct tagagtaggt gtgctctctc 180
aaatataatca tagtcccaca gtttatttca tgtatatatt ctgcctgaat cacatagaca 240
tttgaatttg caacgcctga tgtaaatata taaattctta ccaatcagaa acatagcaag 300
aaattcaggg acttggtcat yatcagggtg tgacagcana tcctgtara aacctgata 360

cacactcaca cacgtatgca acgtggagat gtcgcyttww kkktywecwm rmrycrwecn 420
aatcacttan n 431

<210> 282
<211> 98
<212> DNA
<213> Homo sapien

<400> 282
attcgattcg atgcttgagc ccaggagttc aagactgcag tgagccactg cacttcaggc 60
tggacaacag agcgagtccc tgtgccaaaa aaaaaaaaa 98

<210> 283
<211> 764
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)... (764)
<223> n = A,T,C or G

<400> 283
tttttttttt ttcgcaagca cgtgcacttt attgaatgac actgtagaca ggtgtgtggg 60
tataaactgc tgtatctagg ggcaggacca agggggcagg ggcaacagcc ccagcgtgca 120
gggccascac tgcacagtgg astgcaaagg ttgcaggcta tgggcggcta ctavtaaccc 180
cgtttttccct gtattatctg taacataata tggtagactg tcacagagcc gaatwccart 240
hacascgatga atccaawggt caygaggatg cccasaatca gggcccasat sttcaggcac 300
ttggcgggtgg gggcatasgc ctgkgccccg gtcacgtcsc caaccwtcty cctgtcccta 360
cmcttgawtc cncnccctnn nntnccntna tntgcccgc cncctcctng ngteaaccng 420
natctgcact anctccctcn ccccttntgg antctctntcc ttcaantaan nttatccttn 480
acneccccct cncctttccc ctncncccn tnateccngn nccnctatca ntentnccct 540
cncntnctn cnnatcggtc cncctnntaa ctacncttn nacnanncc cactnatncc 600
ngnnantttc ttccttccct cccnacgcnn tgcgtgcgcc cgtctngcct nnnctnecgna 660
ccnnaacttt atttaccctt ncaccctagc nctctacttn acccancnc tectacctcc 720
ngnccaccc nncctnatc nctnnctctn tcnntctnt cccc 764

<210> 284
<211> 157
<212> DNA
<213> Homo sapien

<400> 284
caagtgtagg cacagtgatg aaagcctgga gcaaacacaa tctgtgggta attaacgttt 60
atttctcccc ttccagggaac gtcttgcatg gatgatcaaa gatcagctcc tgggtcaacat 120
aaataagcta gtttaagata cgttccccta cacttga 157

<210> 285
<211> 150
<212> DNA
<213> Homo sapien

<400> 285
attcgattgt actcagacaa caatatgcta agtgggaagaa gtcagtcaca aaagaccaca 60
tactgtatga cttcatttac attaagtgtc cagaataggc aaatccgtag agacagaaag 120

tagatgagca gctgcctagg tctgagtaca

150

<210> 286
<211> 219
<212> DNA
<213> Homo sapien

<400> 286
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ataaatgcaa gtctcaccac cagatgtgaa attacagtaa actttgaagg aatctcctga 120
gcaaccttgg ttaggatcaa tccaatattc accatctggg aagtcaggat ggctgagttg 180
caggtcttta caagttcggg ctggattggt ctgagtaca 219

<210> 287
<211> 196
<212> DNA
<213> Homo sapien

<400> 287
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atccatactc agaaggaacc aacctgtctg acaccttaat ttcagcttct ggctcttaga 120
actgtgagag agtacatttc tcttggttta agccaagaga atctgtcttt tggctactta 180
tatcatagcc tcaaga 196

<210> 288
<211> 199
<212> DNA
<213> Homo sapien

<400> 288
attcgatttc agtccagtcc cagaaccac attgtcaatt actactctgt araagattca 60
tttgttgaaa ttcattgagt aaaacattta tgatccctta atatatgcca attaccatgc 120
taggtactga agattcaagt gaccgagatg ctagcccttg ggttcaagtg atccctctcc 180
cagagtgcac tggactgaa 199

<210> 289
<211> 182
<212> DNA
<213> Homo sapien

<400> 289
attcgattct tgaggctaca aacctgtaca gtatgttact ctactgaata ctgtaggcaa 60
tagtaataca gaagcaagta tctgtatatg taaacattaa aaaggtacag tgaaacttca 120
gtattataat cttagggacc accattatat atgtgggtcca tcattggcca aaaaaaaaaa 180
aa 182

<210> 290
<211> 1646
<212> DNA
<213> Homo sapien

<400> 290
ggcaccgagga gaaatgtaat tccatatttt atttgaaact tattccatat ttttaattgga 60
tattgagtga ttgggttatc aaacaccac aaactttaat tttgttaaatt ttatatggct 120
ttgaaataga agtataagtt gctaccattt tttgataaca ttgaaagata gtattttacc 180

atctttaatc	atcttgga	atacaagtc	tgtgaacaac	cactctttca	cctagcagca	240
tgaggccaaa	agtaaaggct	ttaaattata	acatatggga	ttcttagtag	tatgtttttt	300
tcttgaaact	cagtggctct	atctaaccct	actatctcct	cactctttct	ctaagactaa	360
actctaggct	cttaaaaaatc	tgcccacacc	aatcttagaa	gctctgaaaa	gaatttgtct	420
ttaaataatct	tttaatatga	acatgtatct	tatggaccaa	attgacattt	tcgactatct	480
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gcagtctcct	ttaaaggtaga	acaaataact	tctatctttt	tttcaccatt	gtgggattgg	660
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gtttatagca	gaagttattt	atttctatgg	cattccagcg	gatatttttg	tgtttgcgag	1500
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aaaaaaaaaa	aaaaaaaaaa	aaaaaa				1646

<210> 291

<211> 1851

<212> DNA

<213> Homo sapien

<400> 291

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tcacttcctt	taagcctttg	tgactcttcc	tctgatgtca	gctttaagtc	ttgttctgga	180
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cttttcccca	tttagtatta	tggtggctgt	gggcttgta	taggtgggtt	ttattacttt	1800
aaggtatgtc	ccttctatgc	ctgttttgct	gaggggttta	attctcgtgc	c	1851

<210> 292
 <211> 1851
 <212> DNA
 <213> Homo sapien

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tcacttcctt	taagcctttg	tgactcttcc	tctgatgtca	gctttaagtc	ttgttctgga	180
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cacaggtact	gaatcatgtg	catctgcggc	aacatggttg	aacctaccca	atcacacatc	1320
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gctcctgaga	aacaccccag	ctcttcgggt	ctaacacag	caagtcaata	aatgtgata	1620
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aaggtatgtc	ccttctatgc	ctgttttgct	gaggggttta	attctcgtgc	c	1851

<210> 293
 <211> 668
 <212> DNA
 <213> Homo sapien

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cgtctgtcca	gcaggagttt	tactacttct	gaattcccat	tggcagaggg	cagatgtaga	540
gcagtcctat	gagagtgaga	agacttttta	ggaaattgta	gtgcactagc	tacagccata	600
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<210> 294

<211> 1512

<212> DNA

<213> Homo sapien

<400> 294

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tccatgcccg	ctgcttcttc	tgtgaagaag	ccatttggtc	tcaggagcaa	gatgggcaag	300
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<210> 295

<211> 1853

<212> DNA

<213> Homo sapien

<400> 295

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cactgcttcc	cctgctgcag	ggggagtggc	aagagcaacg	tgggcgcttc	tggagaccac	480
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<210> 296

<211> 2184

<212> DNA

<213> Homo sapien

<400> 296

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<210> 297

<211> 1855

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (1855)

<223> n = A,T,C or G

<400> 297

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<210> 298
 <211> 1059
 <212> DNA
 <213> Homo sapien

<400> 298
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<210> 299
 <211> 329
 <212> PRT
 <213> Homo sapien

<400> 299
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 20 25 30
 Glu Tyr Thr Ile Val His Ala Ser Phe Ile Ser Cys Ile Ser Ser Ser
 35 40 45
 Leu Asp Gly Gln Gly Glu Arg Gln Glu Gln Arg Gly His Phe Trp Arg
 50 55 60
 Pro Gln Arg Leu Leu Cys Glu Asp Ala Trp Glu Gln Glu Val Gln Val
 65 70 75 80
 Val Leu Pro Leu Leu Pro Leu Leu Gln Gly Ser Gly Lys Ser Asn Val
 85 90 95
 Val Ala Trp Gly Asp Tyr Asp Asp Ser Ala Phe Met Asp Pro Arg Tyr
 100 105 110
 His Val His Gly Glu Asp Leu Asp Lys Leu His Arg Ala Ala Trp Trp
 115 120 125
 Gly Lys Val Pro Arg Lys Asp Leu Ile Val Met Leu Arg Asp Thr Asp
 130 135 140
 Val Asn Lys Arg Asp Lys Gln Lys Arg Thr Ala Leu His Leu Ala Ser

[illegible]

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<210> 300
<211> 148
<212> PRT
<213> Homo sapien
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<222> (1)...(148)  
<223> Xaa = Any Amino Acid
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[illegible]

<210> 301
<211> 1155
<212> DNA
<213> Homo sapien

<400> 301
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<210> 302
<211> 2000
<212> DNA
<213> Homo sapien

<400> 302
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cctgacaacg	aaagtgaaga	gtatcacaga	atttgcgaa	tagtttctga	ctacaaagaa	1440
aaacagatgc	caaaataactc	ttctgaaaac	agcaaccag	aacaagactt	aaagctgaca	1500
tcagaggaag	agtcacaaag	gcttgagggc	agtgaaaatg	gccagccaga	gctagaaaaat	1560
tttatggcta	tcgaagaaat	gaagaagcac	ggaagtactc	atgtcggatt	cccagaaaaac	1620
ctgactaatg	gtgccactgc	tggcaatggt	gatgatggat	taattcctcc	aaggaagagc	1680
agaacacctg	aaagccagca	atttcctgac	actgagaatg	aagagtatca	cagtgcagaa	1740
caaaatgata	ctcagaagca	attttgtgaa	gaacagaaca	ctggaatatt	acacgatgag	1800
attctgattc	atgaagaaaa	gcagatagaa	gtggttgaaa	aaatgaattc	tgagctttct	1860
cttagttgta	agaaagaaaa	agacatcttg	catgaaaata	gtacgttgcg	ggaagaaatt	1920
gccatgctaa	gactggagct	agacacaatg	aaacatcaga	gccagctaaa	aaaaaaaaaa	1980
aaaaaaaaaa	aaaaaaaaaa					2000

<210> 303
 <211> 2040
 <212> DNA
 <213> Homo sapien

<400> 303

atggtggttg	aggttgattc	catgccggct	gcctcttctg	tgaagaagcc	atttgggtctc	60
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agcaacgtgg	gcacttctgg	agaccacgac	gactctgcta	tgaagacact	caggagcaag	180
atgggcaagt	ggtgccgcca	ctgcttcccc	tgctgcaggg	ggagtggcaa	gagcaacgtg	240
ggcgcttctg	gagaccacga	cgactctgct	atgaagacac	tcaggaacaa	gatgggcaag	300
tggtgctgcc	actgcttccc	ctgctgcagg	gggagcggca	agagcaaggt	gggcgcttgg	360
ggagactacg	atgacagtgc	cttcattggag	cccagggtacc	acgtccgtgg	agaagatctg	420
gacaagctcc	acagagctgc	ctggtggggg	aaagtcccca	gaaaggatct	catcgctcatg	480
ctcagggaca	ctgacgtgaa	caagaaggac	aagcaaaaaga	ggactgctct	acatctggcc	540
tctgccaatg	ggaattcaga	agtagtaaaa	ctcctgctgg	acagacgatg	tcaacttaat	600
gtccttgaca	acaaaaagag	gacagctctg	ataaaggccg	tacaatgcc	ggaagatgaa	660
tgtgcgttaa	tggtgctgga	acatggcact	gatccaaata	ttccagatga	gtatggaaat	720
accactctgc	actacgctat	ctataatgaa	gataaattaa	tggccaaagc	actgctctta	780
tatggtgctg	atatacgaatc	aaaaaacaag	catggcctca	caccactgtt	acttgggtgta	840
catgagcaaa	aacagcaagt	cgtgaaattt	ttaatacaaga	aaaaagcgaa	tttaaatgca	900
ctggatagat	atggaaggac	tgctctcata	cttgctgtat	gttggtggatc	agcaagtata	960
gtcagccttc	tacttgagca	aaatattgat	gtatcttctc	aagatctatc	tggacagacg	1020
gccagagagt	atgctgtttc	tagtcatcat	catgtaattt	gccagttact	ttctgactac	1080
aaagaaaaac	agatgctaaa	aatctcttct	gaaaacagca	atccagaaca	agacttaaag	1140
ctgacatcag	aggaagagtc	acaaagggtc	aaaggcagtg	aaaatagcca	gccagagaaa	1200
atgtctcaag	aaccagaaat	aaataaggat	ggtgatagag	aggttgaaga	agaaatgaag	1260
aagcatgaaa	gtaataatgt	gggattacta	gaaaacctga	ctaattggtgt	cactgctggc	1320
aatggtgata	atggattaat	tcctcaaagg	aagagcagaa	cacctgaaaa	tcagcaattt	1380
cctgacaacg	aaagtgaaga	gtatcacaga	atttgcgaa	tagtttctga	ctacaaagaa	1440
aaacagatgc	caaaataactc	ttctgaaaac	agcaaccag	aacaagactt	aaagctgaca	1500
tcagaggaag	agtcacaaag	gcttgagggc	agtgaaaatg	gccagccaga	gaaaagatct	1560
caagaaccag	aaataaataa	ggatggtgat	agagagctag	aaaattttat	ggctatcgaa	1620
gaaatgaaga	agcacggaag	tactcatgtc	ggattcccag	aaaacctgac	taatggtgcc	1680
actgctggca	atggtgatga	tggattaatt	cctccaagga	agagcagaac	acctgaaagc	1740
cagcaatttc	ctgacactga	gaatgaagag	tatcacagtg	acgaacaaaa	tgatactcag	1800
aagcaatttt	gtgaagaaca	gaacactgga	atattacacg	atgagattct	gattactgaa	1860
gaaaagcaga	tagaagtggg	tgaaaaaatg	aattctgagc	tttctcttag	ttgtaagaaa	1920
gaaaagaca	tcttgcata	aaatagtacg	tgcgggaag	aaattgccat	gctaagactg	1980
gagctagaca	caatgaaaca	tcagagccag	ctaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	2040

<210> 304
 <211> 384
 <212> PRT
 <213> Homo sapien

<400> 304
 Met Val Val Glu Val Asp Ser Met Pro Ala Ala Ser Ser Val Lys Lys
 1 5 10 15
 Pro Phe Gly Leu Arg Ser Lys Met Gly Lys Trp Cys Cys Arg Cys Phe
 20 25 30
 Pro Cys Cys Arg Glu Ser Gly Lys Ser Asn Val Gly Thr Ser Gly Asp
 35 40 45
 His Asp Asp Ser Ala Met Lys Thr Leu Arg Ser Lys Met Gly Lys Trp
 50 55 60
 Cys Arg His Cys Phe Pro Cys Cys Arg Gly Ser Gly Lys Ser Asn Val
 65 70 75 80
 Gly Ala Ser Gly Asp His Asp Asp Ser Ala Met Lys Thr Leu Arg Asn
 85 90 95
 Lys Met Gly Lys Trp Cys Cys His Cys Phe Pro Cys Cys Arg Gly Ser
 100 105 110
 Gly Lys Ser Lys Val Gly Ala Trp Gly Asp Tyr Asp Asp Ser Ala Phe
 115 120 125
 Met Glu Pro Arg Tyr His Val Arg Gly Glu Asp Leu Asp Lys Leu His
 130 135 140
 Arg Ala Ala Trp Trp Gly Lys Val Pro Arg Lys Asp Leu Ile Val Met
 145 150 155 160
 Leu Arg Asp Thr Asp Val Asn Lys Lys Asp Lys Gln Lys Arg Thr Ala
 165 170 175
 Leu His Leu Ala Ser Ala Asn Gly Asn Ser Glu Val Val Lys Leu Leu
 180 185 190
 Leu Asp Arg Arg Cys Gln Leu Asn Val Leu Asp Asn Lys Lys Arg Thr
 195 200 205
 Ala Leu Ile Lys Ala Val Gln Cys Gln Glu Asp Glu Cys Ala Leu Met
 210 215 220
 Leu Leu Glu His Gly Thr Asp Pro Asn Ile Pro Asp Glu Tyr Gly Asn
 225 230 235 240
 Thr Thr Leu His Tyr Ala Ile Tyr Asn Glu Asp Lys Leu Met Ala Lys
 245 250 255
 Ala Leu Leu Leu Tyr Gly Ala Asp Ile Glu Ser Lys Asn Lys His Gly
 260 265 270
 Leu Thr Pro Leu Leu Leu Gly Val His Glu Gln Lys Gln Gln Val Val
 275 280 285
 Lys Phe Leu Ile Lys Lys Lys Ala Asn Leu Asn Ala Leu Asp Arg Tyr
 290 295 300
 Gly Arg Thr Ala Leu Ile Leu Ala Val Cys Cys Gly Ser Ala Ser Ile
 305 310 315 320
 Val Ser Leu Leu Leu Glu Gln Asn Ile Asp Val Ser Ser Gln Asp Leu
 325 330 335
 Ser Gly Gln Thr Ala Arg Glu Tyr Ala Val Ser Ser His His His Val
 340 345 350
 Ile Cys Gln Leu Leu Ser Asp Tyr Lys Glu Lys Gln Met Leu Lys Ile
 355 360 365
 Ser Ser Glu Asn Ser Asn Pro Glu Asn Val Ser Arg Thr Arg Asn Lys
 370 375 380

<210> 305
 <211> 656
 <212> PRT
 <213> Homo sapien

<400> 305
 Met Val Val Glu Val Asp Ser Met Pro Ala Ala Ser Ser Val Lys Lys
 1 5 10 15
 Pro Phe Gly Leu Arg Ser Lys Met Gly Lys Trp Cys Cys Arg Cys Phe
 20 25 30
 Pro Cys Cys Arg Glu Ser Gly Lys Ser Asn Val Gly Thr Ser Gly Asp
 35 40 45
 His Asp Asp Ser Ala Met Lys Thr Leu Arg Ser Lys Met Gly Lys Trp
 50 55 60
 Cys Arg His Cys Phe Pro Cys Cys Arg Gly Ser Gly Lys Ser Asn Val
 65 70 75 80
 Gly Ala Ser Gly Asp His Asp Asp Ser Ala Met Lys Thr Leu Arg Asn
 85 90 95
 Lys Met Gly Lys Trp Cys Cys His Cys Phe Pro Cys Cys Arg Gly Ser
 100 105 110
 Gly Lys Ser Lys Val Gly Ala Trp Gly Asp Tyr Asp Asp Ser Ala Phe
 115 120 125
 Met Glu Pro Arg Tyr His Val Arg Gly Glu Asp Leu Asp Lys Leu His
 130 135 140
 Arg Ala Ala Trp Trp Gly Lys Val Pro Arg Lys Asp Leu Ile Val Met
 145 150 155 160
 Leu Arg Asp Thr Asp Val Asn Lys Lys Asp Lys Gln Lys Arg Thr Ala
 165 170 175
 Leu His Leu Ala Ser Ala Asn Gly Asn Ser Glu Val Val Lys Leu Leu
 180 185 190
 Leu Asp Arg Arg Cys Gln Leu Asn Val Leu Asp Asn Lys Lys Arg Thr
 195 200 205
 Ala Leu Ile Lys Ala Val Gln Cys Gln Glu Asp Glu Cys Ala Leu Met
 210 215 220
 Leu Leu Glu His Gly Thr Asp Pro Asn Ile Pro Asp Glu Tyr Gly Asn
 225 230 235 240
 Thr Thr Leu His Tyr Ala Ile Tyr Asn Glu Asp Lys Leu Met Ala Lys
 245 250 255
 Ala Leu Leu Leu Tyr Gly Ala Asp Ile Glu Ser Lys Asn Lys His Gly
 260 265 270
 Leu Thr Pro Leu Leu Leu Gly Val His Glu Gln Lys Gln Gln Val Val
 275 280 285
 Lys Phe Leu Ile Lys Lys Lys Ala Asn Leu Asn Ala Leu Asp Arg Tyr
 290 295 300
 Gly Arg Thr Ala Leu Ile Leu Ala Val Cys Cys Gly Ser Ala Ser Ile
 305 310 315 320
 Val Ser Leu Leu Leu Glu Gln Asn Ile Asp Val Ser Ser Gln Asp Leu
 325 330 335
 Ser Gly Gln Thr Ala Arg Glu Tyr Ala Val Ser Ser His His Val
 340 345 350
 Ile Cys Gln Leu Leu Ser Asp Tyr Lys Glu Lys Gln Met Leu Lys Ile
 355 360 365
 Ser Ser Glu Asn Ser Asn Pro Glu Gln Asp Leu Lys Leu Thr Ser Glu
 370 375 380
 Glu Glu Ser Gln Arg Phe Lys Gly Ser Glu Asn Ser Gln Pro Glu Lys

385 390 395 400
 Met Ser Gln Glu Pro Glu Ile Asn Lys Asp Gly Asp Arg Glu Val Glu
 405 410 415
 Glu Glu Met Lys Lys His Glu Ser Asn Asn Val Gly Leu Leu Glu Asn
 420 425 430
 Leu Thr Asn Gly Val Thr Ala Gly Asn Gly Asp Asn Gly Leu Ile Pro
 435 440 445
 Gln Arg Lys Ser Arg Thr Pro Glu Asn Gln Gln Phe Pro Asp Asn Glu
 450 455 460
 Ser Glu Glu Tyr His Arg Ile Cys Glu Leu Val Ser Asp Tyr Lys Glu
 465 470 475 480
 Lys Gln Met Pro Lys Tyr Ser Ser Glu Asn Ser Asn Pro Glu Gln Asp
 485 490 495
 Leu Lys Leu Thr Ser Glu Glu Glu Ser Gln Arg Leu Glu Gly Ser Glu
 500 505 510
 Asn Gly Gln Pro Glu Leu Glu Asn Phe Met Ala Ile Glu Glu Met Lys
 515 520 525
 Lys His Gly Ser Thr His Val Gly Phe Pro Glu Asn Leu Thr Asn Gly
 530 535 540
 Ala Thr Ala Gly Asn Gly Asp Asp Gly Leu Ile Pro Pro Arg Lys Ser
 545 550 555 560
 Arg Thr Pro Glu Ser Gln Gln Phe Pro Asp Thr Glu Asn Glu Glu Tyr
 565 570 575
 His Ser Asp Glu Gln Asn Asp Thr Gln Lys Gln Phe Cys Glu Glu Gln
 580 585 590
 Asn Thr Gly Ile Leu His Asp Glu Ile Leu Ile His Glu Glu Lys Gln
 595 600 605
 Ile Glu Val Val Glu Lys Met Asn Ser Glu Leu Ser Leu Ser Cys Lys
 610 615 620
 Lys Glu Lys Asp Ile Leu His Glu Asn Ser Thr Leu Arg Glu Glu Ile
 625 630 635 640
 Ala Met Leu Arg Leu Glu Leu Asp Thr Met Lys His Gln Ser Gln Leu
 645 650 655

<210> 306

<211> 671

<212> PRT

<213> Homo sapien

<400> 306

Met Val Val Glu Val Asp Ser Met Pro Ala Ala Ser Ser Val Lys Lys
 1 5 10 15
 Pro Phe Gly Leu Arg Ser Lys Met Gly Lys Trp Cys Cys Arg Cys Phe
 20 25 30
 Pro Cys Cys Arg Glu Ser Gly Lys Ser Asn Val Gly Thr Ser Gly Asp
 35 40 45
 His Asp Asp Ser Ala Met Lys Thr Leu Arg Ser Lys Met Gly Lys Trp
 50 55 60
 Cys Arg His Cys Phe Pro Cys Cys Arg Gly Ser Gly Lys Ser Asn Val
 65 70 75 80
 Gly Ala Ser Gly Asp His Asp Asp Ser Ala Met Lys Thr Leu Arg Asn
 85 90 95
 Lys Met Gly Lys Trp Cys Cys His Cys Phe Pro Cys Cys Arg Gly Ser
 100 105 110
 Gly Lys Ser Lys Val Gly Ala Trp Gly Asp Tyr Asp Asp Ser Ala Phe

115	120	125
Met Glu Pro Arg Tyr His	Val Arg Gly Glu Asp Leu Asp Lys Leu His	
130	135	140
Arg Ala Ala Trp Trp Gly Lys Val Pro Arg Lys Asp Leu Ile Val Met		
145	150	155
Leu Arg Asp Thr Asp Val Asn Lys Lys Asp Lys Gln Lys Arg Thr Ala		
165	170	175
Leu His Leu Ala Ser Ala Asn Gly Asn Ser Glu Val Val Lys Leu Leu		
180	185	190
Leu Asp Arg Arg Cys Gln Leu Asn Val Leu Asp Asn Lys Lys Arg Thr		
195	200	205
Ala Leu Ile Lys Ala Val Gln Cys Gln Glu Asp Glu Cys Ala Leu Met		
210	215	220
Leu Leu Glu His Gly Thr Asp Pro Asn Ile Pro Asp Glu Tyr Gly Asn		
225	230	235
Thr Thr Leu His Tyr Ala Ile Tyr Asn Glu Asp Lys Leu Met Ala Lys		
245	250	255
Ala Leu Leu Leu Tyr Gly Ala Asp Ile Glu Ser Lys Asn Lys His Gly		
260	265	270
Leu Thr Pro Leu Leu Leu Gly Val His Glu Gln Lys Gln Gln Val Val		
275	280	285
Lys Phe Leu Ile Lys Lys Lys Ala Asn Leu Asn Ala Leu Asp Arg Tyr		
290	295	300
Gly Arg Thr Ala Leu Ile Leu Ala Val Cys Cys Gly Ser Ala Ser Ile		
305	310	315
Val Ser Leu Leu Leu Glu Gln Asn Ile Asp Val Ser Ser Gln Asp Leu		
325	330	335
Ser Gly Gln Thr Ala Arg Glu Tyr Ala Val Ser Ser His His His Val		
340	345	350
Ile Cys Gln Leu Leu Ser Asp Tyr Lys Glu Lys Gln Met Leu Lys Ile		
355	360	365
Ser Ser Glu Asn Ser Asn Pro Glu Gln Asp Leu Lys Leu Thr Ser Glu		
370	375	380
Glu Glu Ser Gln Arg Phe Lys Gly Ser Glu Asn Ser Gln Pro Glu Lys		
385	390	395
Met Ser Gln Glu Pro Glu Ile Asn Lys Asp Gly Asp Arg Glu Val Glu		
405	410	415
Glu Glu Met Lys Lys His Glu Ser Asn Asn Val Gly Leu Leu Glu Asn		
420	425	430
Leu Thr Asn Gly Val Thr Ala Gly Asn Gly Asp Asn Gly Leu Ile Pro		
435	440	445
Gln Arg Lys Ser Arg Thr Pro Glu Asn Gln Gln Phe Pro Asp Asn Glu		
450	455	460
Ser Glu Glu Tyr His Arg Ile Cys Glu Leu Val Ser Asp Tyr Lys Glu		
465	470	475
Lys Gln Met Pro Lys Tyr Ser Ser Glu Asn Ser Asn Pro Glu Gln Asp		
485	490	495
Leu Lys Leu Thr Ser Glu Glu Glu Ser Gln Arg Leu Glu Gly Ser Glu		
500	505	510
Asn Gly Gln Pro Glu Lys Arg Ser Gln Glu Pro Glu Ile Asn Lys Asp		
515	520	525
Gly Asp Arg Glu Leu Glu Asn Phe Met Ala Ile Glu Glu Met Lys Lys		
530	535	540
His Gly Ser Thr His Val Gly Phe Pro Glu Asn Leu Thr Asn Gly Ala		
545	550	555
		560

Thr Ala Gly Asn Gly Asp Asp Gly Leu Ile Pro Pro Arg Lys Ser Arg
 565 570 575
 Thr Pro Glu Ser Gln Gln Phe Pro Asp Thr Glu Asn Glu Glu Tyr His
 580 585 590
 Ser Asp Glu Gln Asn Asp Thr Gln Lys Gln Phe Cys Glu Glu Gln Asn
 595 600 605
 Thr Gly Ile Leu His Asp Glu Ile Leu Ile His Glu Glu Lys Gln Ile
 610 615 620
 Glu Val Val Glu Lys Met Asn Ser Glu Leu Ser Leu Ser Cys Lys Lys
 625 630 635 640
 Glu Lys Asp Ile Leu His Glu Asn Ser Thr Leu Arg Glu Glu Ile Ala
 645 650 655
 Met Leu Arg Leu Glu Leu Asp Thr Met Lys His Gln Ser Gln Leu
 660 665 670

<210> 307
 <211> 800
 <212> DNA
 <213> Homo sapien

<400> 307
 atkagcttcc gcttctgaca acactagaga tccctcccct ccctcagggg atggccctcc 60
 acttcatttt tggtacataa catctttata ggacaggggt aaaatcccaa tactaacagg 120
 agaatgctta ggactctaac aggtttttga gaatgtgttg gtaagggcca ctcaatccaa 180
 tttttcttgg tcctccttgt ggtctaggag gacaggcaag ggtgcagatt ttcaagaatg 240
 catcagtaag ggccactaaa tccgaccttc ctctgttctc cttgttgtct gggaggaaaa 300
 ctagtgtttc tgttgctgtg tcagttagca caactattcc gatcagcagg gtccagggac 360
 cactgcaggt tcttgggcag ggggagaaac aaaacaaacc aaaaccatgg gcrgttttgt 420
 ctttcagatg ggaaacactc aggcataaac aggctcacct ttgaaatgca tcctaagcca 480
 atgggacaaa tttgacccac aaaccctgga aaaagaggtg gtcattttt tttgcactat 540
 ggcttggccc caacattctc tctctgatgg ggaaaaatgg ccacctgagg gaagtacaga 600
 ttacaatact atcctgcage ttgacctttt ctgtaagagg gaaggcaaat ggagtgaat 660
 accttatgtc caagctttct tttcattgaa ggagaataca ctatgcaaag cttgaaat 720
 acatcccaca ggaggacctc tcagcttacc cccatatact agcctcccta tagctcccct 780
 tcctattagt gataagcctc 800

<210> 308
 <211> 102
 <212> PRT
 <213> Homo sapien

<220>
 <221> VARIANT
 <222> (1)...(102)
 <223> Xaa = Any Amino Acid

<400> 308
 Met Gly Xaa Phe Val Phe Gln Met Gly Asn Thr Gln Ala Ser Thr Gly
 1 5 10 15
 Ser Pro Leu Lys Cys Ile Leu Ser Gln Trp Asp Lys Phe Asp Pro Gln
 20 25 30
 Thr Leu Glu Lys Glu Val Ala His Phe Phe Cys Thr Met Ala Trp Pro
 35 40 45
 Gln His Ser Leu Ser Asp Gly Glu Lys Trp Pro Pro Glu Gly Ser Thr
 50 55 60

Asp Tyr Asn Thr Ile Leu Gln Leu Asp Leu Phe Cys Lys Arg Glu Gly
 65. 70 75 80
 Lys Trp Ser Glu Ile Pro Tyr Val Gln Ala Phe Phe Ser Leu Lys Glu
 85 90 95
 Asn Thr Leu Cys Lys Ala
 100

<210> 309
 <211> 9
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Made in the lab

<400> 309
 Leu Met Ala Glu Glu Tyr Thr Ile Val
 1 5

<210> 310
 <211> 9
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Made in the lab

<400> 310
 Lys Leu Met Ala Lys Ala Leu Leu Leu
 1 5

<210> 311
 <211> 9
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Made in the lab

<400> 311
 Gly Leu Thr Pro Leu Leu Leu Gly Ile
 1 5

<210> 312
 <211> 10
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Made in the lab

<400> 312
 Lys Leu Val Leu Asp Arg Arg Cys Gln Leu
 1 5 10

<210> 313
<211> 1852
<212> DNA
<213> Homo sapiens

<400> 313
ggcagcagaa ttaaaaccct cagcaaaaca ggcataagaag ggacatacct taaagtaata 60
aaaaccacct atgacaagcc cacagccaac ataatactaa atggggaaaaa gttagaagca 120
tttctctga gaactgcaac aataaatata aggatgctgg attttgtcaa atgccttttc 180
tgtgtctgtt gagatgctta tgtgactttg cttttaattc tgtttatgtg attatcacat 240
ttattgactt gcctgtgtta gaccggaaga gctggggtgt ttctcaggag ccaccgtgtg 300
ctgcggcagc ttccgggataa cttgaggctg catcactggg gaagaaacac aytccgtgcc 360
gtggcgctga tggctgagga cagagcttca gtgtggcttc tctgcgactg gcttcttcgg 420
ggagttcttc cttcatagtt catccatag gctccagagg aaaattatat tattttgtta 480
tggatgaaga gtattacgtt gtgcagatat actgcagtgt cttcatctct tgatgtgtga 540
ttgggtaggt tccaccatgt tgccgcagat gacatgattt cagtacctgt gtctggctga 600
aaagtgtttg tttgtgaatg gatattgtgg tttctggatc tcactcctctg tgggtggaca 660
gctttctcca ccttgcctgga agtgacctgc tgtccagaag tttgatggct gaggagtata 720
ccatcgtgca tgcactcttc atttctctga tttctctc cctggatgga cagggggagc 780
ggcaagagca acgtgggcac ttctggagac cacaacgact cctctgtgaa gacgcttggg 840
agcaagaggt gcaagtgggt ctgccactgc tccccctgct gcagggggag cggcaagagc 900
aacgtggctg cttggggaga ctacgatgac agcgcttca tggatcccag gtaccacgtc 960
catggagaag atctggacaa gctccacaga gctgcctggg ggggtaaagt cccagaaaag 1020
gatctcatcg tcatgctcag ggacacggat gtgaacaaga gggacaagca aaagaggact 1080
gctctacatc tggcctctgc caatgggaat tcagaagtag taaaactcgt gctggacaga 1140
cgatgtcaac ttaatgtcct tgacaacaaa aagaggacag ctctgacaaa ggccgtacaa 1200
tgccaggaag atgaatgtgc gttaatgttg ctggaacatg gcaactgatc aaatattcca 1260
gatgagtatg gaaataccac tctacactat gctgtctaca atgaagataa attaatggcc 1320
aaagcactgc tcttatacgg tgctgatata gaatcaaaaa acaagcatgg cctcacacca 1380
ctgctacttg gtatacatga gcaaaaacag caagtgggtga aatttttaat caagaaaaaa 1440
gcgaatttaa atgcgtgga tagatatgga agaactgctc tcatacttgc tgtatgttgt 1500
ggatcagcaa gtatagtcag cctctactt gagcaaaatg ttgatgtatc ttctcaagat 1560
ctggaaagac ggccagagag tatgctgttt ctagtcatca tcatgtaatt tgccagttac 1620
tttctgacta caaagaaaaa cagatgttaa aaatctcttc tgaaaacagc aatccagaac 1680
aagacttaaa gctgacatca gaggaagagt cacaagggt taaaggaagt gaaaacagcc 1740
agccagagct agaagattta tggctattga agaagaatga agaacacgga agtactcatg 1800
tgggattccc agaaaacctg actaacgggt ccgctgctgg caatgggtgat ga 1852

<210> 314
<211> 879
<212> DNA
<213> Homo sapiens

<400> 314
atgcatcttt catttctgc atttcttct ccttggatgg acagggggag cggcaagagc 60
aacgtgggca cttctggaga ccacaacgac tcctctgtga agacgcttgg gagcaagagg 120
tgcaagtggg gctgccactg cttccccctg tgccagggga gggcaagag caacgtgggtc 180
gcttggggag actacgatga cagcgcttc atggatccca ggtaccacgt ccatggagaa 240
gatctggaca agctccacag agctgcctgg tggggtaaag tccccagaaa ggaatctcatc 300
gtcatgctca gggacacgga tgtgaacaag agggacaagc aaaagaggac tgctctacat 360
ctggcctctg ccaatgggaa ttcagaagta gtaaaactcg tgctggacag acgatgtcaa 420
cttaatgtcc ttgacaacaa aaagaggaca gctctgacaa aggccgtaca atgccaggaa 480
gatgaatgtg cgtaaatgtt gctggaacat ggcactgatc caaatattcc agatgagtat 540
ggaaatacca ctctacacta tgctgtctac aatgaagata aattaatggc caaagcactg 600
ctcttatacg gtgctgatat cgaatcaaaa aacaagcatg gctcacacc actgctactt 660

ggtatacatg agcaaaaaca gcaagtgggtg aaatttttaa tcaagaaaaa agcgaattta 720
aatgcgctgg atagatatgg aagaactgct ctcatacttg ctgtatgttg tggatcagca 780
agtatatgca gccctctact tgagcaaaat gttgatgtat cttctcaaga tctggaaaga 840
cggccagaga gtatgctgtt tctagtcatc atcatgtaa 879

<210> 315

<211> 293

<212> PRT

<213> Homo sapiens

<400> 315

Met His Leu Ser Phe Pro Ala Phe Leu Pro Pro Trp Met Asp Arg Gly
5 10 15

Ser Gly Lys Ser Asn Val Gly Thr Ser Gly Asp His Asn Asp Ser Ser
20 25 30

Val Lys Thr Leu Gly Ser Lys Arg Cys Lys Trp Cys Cys His Cys Phe
35 40 45

Pro Cys Cys Arg Gly Ser Gly Lys Ser Asn Val Val Ala Trp Gly Asp
50 55 60

Tyr Asp Asp Ser Ala Phe Met Asp Pro Arg Tyr His Val His Gly Glu
65 70 75 80

Asp Leu Asp Lys Leu His Arg Ala Ala Trp Trp Gly Lys Val Pro Arg
85 90 95

Lys Asp Leu Ile Val Met Leu Arg Asp Thr Asp Val Asn Lys Arg Asp
100 105 110

Lys Gln Lys Arg Thr Ala Leu His Leu Ala Ser Ala Asn Gly Asn Ser
115 120 125

Glu Val Val Lys Leu Val Leu Asp Arg Arg Cys Gln Leu Asn Val Leu
130 135 140

Asp Asn Lys Lys Arg Thr Ala Leu Thr Lys Ala Val Gln Cys Gln Glu
145 150 155 160

Asp Glu Cys Ala Leu Met Leu Leu Glu His Gly Thr Asp Pro Asn Ile
165 170 175

Pro Asp Glu Tyr Gly Asn Thr Thr Leu His Tyr Ala Val Tyr Asn Glu
180 185 190

Asp Lys Leu Met Ala Lys Ala Leu Leu Leu Tyr Gly Ala Asp Ile Glu
195 200 205

Ser Lys Asn Lys His Gly Leu Thr Pro Leu Leu Leu Gly Ile His Glu
210 215 220

Gln Lys Gln Gln Val Val Lys Phe Leu Ile Lys Lys Lys Ala Asn Leu
225 230 235 240

Asn Ala Leu Asp Arg Tyr Gly Arg Thr Ala Leu Ile Leu Ala Val Cys
 245 250 255

Cys Gly Ser Ala Ser Ile Val Ser Pro Leu Leu Glu Gln Asn Val Asp
 260 265 270

Val Ser Ser Gln Asp Leu Glu Arg Arg Pro Glu Ser Met Leu Phe Leu
 275 280 285

Val Ile Ile Met
 290

<210> 316

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[illegible][illegible]

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ning of each regular issue of the PCT Gazette.

(54) Title: COMPOSITIONS AND METHODS FOR THE TREATMENT AND DIAGNOSIS OF BREAST CANCER



cDNA PREPARED FROM
NORMAL BREAST TISSUE
FROM THE SAME PATIENT

cDNA PREPARED
FROM BREAST TUMOR

(57) Abstract: Compositions and methods for the detection and therapy of breast cancer are disclosed. The compounds provided include nucleotide sequences that are preferentially expressed in breast tumor tissue, as well as polypeptides encoded by such nucleotide sequences. Vaccines and pharmaceutical compositions comprising such compounds are also provided and may be used, for example, for the prevention and treatment of breast cancer. The polypeptides may also be used for the production of antibodies, which are useful for diagnosing and monitoring the progression of breast cancer in a patient.

WO 00/61753 A3

INTERNATIONAL SEARCH REPORT

Int. .lional Application No
PCT/US 00/09312

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C12N15/12 C07K14/47 C07K16/18 C07K19/00 C12N15/62
A61K38/17 A61K39/395 A61K48/00 C12N5/08 G01N33/574
C12Q1/68

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C12N C07K A61K G01N C12Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 98 45328 A (CORIXA CORPORATION) 15 October 1998 (1998-10-15) page 2, line 7 -page 5, line 22 page 7, line 23 -page 24, line 11; examples 1-4 sequence listing SEQ ID NOs:1, 3-10, 227 ---	1,2,4-60
X	WO 97 25426 A (CORIXA CORPORATION) 17 July 1997 (1997-07-17) page 2, line 8 -page 5, line 11 page 7, line 14 -page 23, line 2; example 1 sequence listing SEQ ID NO:1, 3-10, 227 --- -/--	1,2,4-60

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
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- "&" document member of the same patent family

Date of the actual completion of the international search

8 August 2000

Date of mailing of the international search report

08.11.00

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INTERNATIONAL SEARCH REPORT

SI 800 000

Int. Application No

PCT/US 00/09312

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>WO 97 25431 A (CORIXA CORPORATION) 17 July 1997 (1997-07-17) page 2, line 3 -page 3, line 25 page 4, line 12 -page 17, line 18; examples 1-4 sequence listing SEQ ID NOs:1, 3-10 -----</p>	1,2,4-10

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 00/09312

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

Although claims 21, 22, 29-31 34 37-39 are directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition.
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Claims 1, 2, 4-60 Partially.

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: Partially 1, 2, 4-60

Breast cancer related polypeptide B18Ag1, corresponding polynucleotides comprising SEQ ID NOs:1, 3-10, or 227, and derived oligonucleotides; variants thereof, expression vector and host cell comprising the same; antibody and diagnostic kit containing it, fusion protein comprising the polypeptide; pharmaceutical composition and vaccine comprising any of the above and use therefor in the treatment of cancer, and for removing tumor cells from a sample; use of the polypeptides for stimulating and expanding T-cells and use of such T-cells for inhibiting cancer development; use of the polypeptides for determining the presence of cancer or monitoring the progression of cancer in a patient.

2. Claims: Partially 1-60

Idem as subject 1 for Breast cancer related polypeptide and polynucleotide B21GT2 (B311D) comprising SEQ ID NOs:56, 307, 308, 316 or 317.

3. Claims: Partially 1, 2, 4-60

Idem as subject 1 for Breast cancer related polypeptide and polynucleotide B15Ag1 comprising SEQ ID NOs:27 or 290.

4. Claims: Partially 1, 2, 4-60

Idem as subject 1 for Breast cancer related polypeptide and polynucleotide B31GA1b comprising SEQ ID NOs:148.

5. Claims: Partially 1, 2, 4-60

Idem as subject 1 for Breast cancer related polypeptide and polynucleotide B38GA2a comprising SEQ ID NOs:157.

6. Claims: Partially 1-60

Idem as subject 1 for Breast cancer related polypeptide and polynucleotide B11Ag1 (B305D) and its isoform A comprising SEQ ID NO:292-306, or 309-315.

7. Claims: Claims: Partially 1, 2, 4-60,
all as far as applicable

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Breast cancer related polypeptides, corresponding polynucleotides comprising SEQ ID NOs:11-26 (inventions 7-22), 28-55 (inventions 23-50), 57-86 (inventions 51-80), 142-147 (inventions 81-86), 149-156 (inventions 87-94), 158-226 (inventions 95-163), 228-253 (inventions 164-189), or 255-291 (inventions 190-226), and derived oligonucleotides; variants thereof, expression vector and host cell comprising the same; antibody and diagnostic kit containing it, fusion protein comprising the polypeptide; pharmaceutical composition and vaccine comprising any of the above and use therefor in the treatment of cancer, and for removing tumor cells from a sample; use of the polypeptides for stimulating and expanding T-cells and use of such T-cells for inhibiting cancer development; use of the polypeptides for inhibiting or monitoring the progression of cancer in a patient, as far as applicable.

INTERNATIONAL SEARCH REPORT

Information on patent family members

Int. l. Application No

PCT/US 00/09312

Pat nt document cited in search report	Publication date	Patent family member(s)	Publication dat
WO 9845328 A	15-10-1998	AU 6956098 A EP 0975666 A NO 994932 A PL 336349 A ZA 9802968 A	30-10-1998 02-02-2000 07-12-1999 19-06-2000 27-10-1998
WO 9725426 A	17-07-1997	AU 1697497 A BR 9707125 A CA 2242340 A CN 1211279 A EP 0874902 A NO 983183 A	01-08-1997 20-07-1999 17-07-1997 17-03-1999 04-11-1998 10-09-1998
WO 9725431 A	17-07-1997	AU 1575697 A	01-08-1997

